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Responsible entrepreneurship for sustainable development

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Environment for Development: People, Planet, Prosperity

Klaus Toepfer
United Nations Under Secretary-General and Executive Director, UNEP

UNEP's new Global Environment Outlook 3 presents the hard facts about the state of this wonderful blue planet of ours, and the tough choices needed right away if we are to restore its health and natural wealth.

Today 20% of the Earth's people consume 90% of its resources; meanwhile some 4 billion people live on less than US$ 2 per day. This pattern is not sustainable — nor is the rate of resource depletion. If we do not act rapidly, by 2032 more than half the world's people will live in water-stressed areas. In addition, expansion of cities, roads and other infrastructure will entail the disturbance or outright destruction of habitats and wildlife on over 70% of the planet's total land surface. GEO 3 gives many other examples of the unsustainability of our current path.

This issue of Industry and Environment is part of UNEP's contribution to the World Summit on Sustainable Development in Johannesburg. It examines the role of business and industry in bringing about the changes urgently needed for sustainable development.

Clearly, business is a vital part of the solution. We increasingly rely on business not only to reduce the environmental impact of products and services, but also for the innovative and entrepreneurial skills we need to help meet sustainability challenges.

Earlier this year UNEP helped 22 industry sector associations to produce reports assessing these sectors' achievements over the last decade as well as the challenges they face. Part of this "Industry as a Partner for Sustainable Development" series is an overview report, whose unequivocal message is that business efforts to reduce environmental damage are not keeping pace with the worsening state of the planet.

The growing gap is due first of all to the fact that only a few, mostly larger companies are incorporating sustainability into business decisions. The silent majority are watching from the sidelines. The other key factor is what is called the "rebound effect": gains in sustainability are being overtaken by economic growth and increasing demand for goods and services. While business alone cannot solve the latter problem, it holds the key to addressing the former.

The news from GEO 3 is not all bad. Thanks to both regulation and voluntary public-private initiatives, river and air quality, for instance, have improved in much of the developed world. The international effort to preserve and repair the protective ozone layer through reducing chlorofluorocarbon production and consumption is another notable success. During the 1990s alone, the number of people with access to improved water supplies rose from 4.1 billion (or 79%) to 4.9 billion (or 82%). Furthermore, we are seeing indications of growing awareness among some industry decision makers. Several hundred companies have pledged to support Secretary-General Kofi Annan's Global Compact. Another example of increased awareness is the spread of the Global Reporting Initiative, which UNEP and the Coalition for Environmentally Responsible Economies established to come up with globally applicable guidelines for reporting the environmental, social and economic impacts of corporate activities.

The importance of corporate openness and disclosure cannot be overemphasized. For business to be an effective agent of change, everyone - from top management to local employees, from shareholders to customers — needs to know how a company sees its mission in terms of economic, environmental and social performance.

And that's just the beginning. This vision needs to be translated into objectives and targets; indicators have to be developed that enable progress towards these targets to be measured; and the results must be accessible to all.

Such responsibility and transparency can improve competitiveness, make voluntary initiatives more robust, and provide new, more lasting business opportunities. Statistics are beginning to show that companies with strong sustainability strategies perform better on the stock markets than those without such strategies.

The Johannesburg Summit, a ten-year follow-up to the 1992 Rio Earth Summit, must be a summit of implementation and action, with the aims of overcoming poverty through investment in jobs and of changing unsustainable consumption patterns in developed countries.

I hope the business community and governments will seize this opportunity to tackle the underlying causes of environmental degradation — especially poverty. And I hope business will offer concrete targets at the summit. For example, can we come to a commitment in Johannesburg that by 2007 the world will be free of leaded gasoline? Or that by 2010 we will cut urban water leakage in Africa from over 50% to 25%?

I would echo Kofi Annan's insistence that results must be obtained in Johannesburg on water/sanitation, energy, health, agriculture and biodiversity — "WEHAB" to use the UN Secretary-General's own mnemonic device - and his hopes that all stakeholders will come together at the WSSD in a new coalition, "a coalition for responsible prosperity," a coalition that will address the widening gulf between rich and poor, fight poverty, adopt more environmentally friendly lifestyles and business practices, and ultimately help forge a peace policy for the world.

UNEP's motto for WSSD is "Environment for Development". Without a sound environment, we cannot have the kind of development that will last. And we must balance the needs and aspirations of government, business and people in both developed and developing countries. Only by working together can we meet the challenge of "Environment for Development: People, Planet, Prosperity." ◆

Responsible entrepreneurship for sustainable development – facts and figures

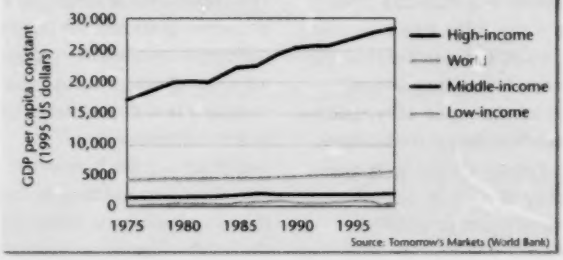
At the 1992 UN Conference on Environment and Development in Rio de Janeiro, business and industry[1] were identified as one of nine major groups involved in implementing Agenda 21 (the UNCED action plan). Ten years later, business representatives to the World Summit on Sustainable Development in Johannesburg are among those reviewing the progress on Agenda 21 and working to move it forward.

This issue of *Industry and Environment* is part of UNEP's contribution to the WSSD. It examines the role of business in bringing about the changes needed for sustainable development. The articles present the views of business, academia, NGOs, an intergovernmental organization and a trade union federation.

To help put these articles and the preparatory work on the WSSD in context, the main trends affecting business worldwide will be examined below. Two new publications are rich sources of relevant facts and figures:

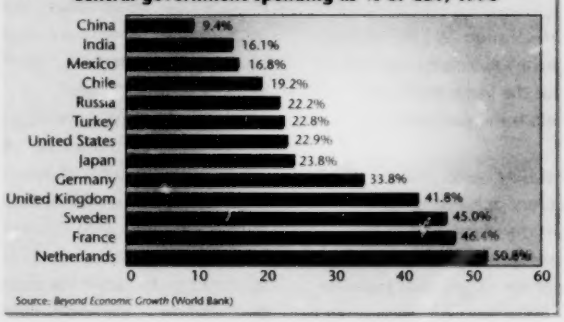
- *Tomorrow's Markets: Global Trends and Their Implications for Business*, a joint publication of UNEP, the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD), is concerned in particular with trends shaping the global business environment.
- UNEP's *Global Environment Outlook 3* reviews progress and setbacks since the 1972 Stockholm Conference on the Human Environment. It assesses the current state of the environment (see box, p. 6) and takes an innovative look at prospects for the next three decades, using four different scenarios. *GEO-3* stresses that action is needed worldwide – at all levels – if sustainable development is to become a reality.

Figure 1
Gross domestic product per capita, 1975-1999



Source: Tomorrow's Markets (World Bank)

Figure 2
Central government spending as % of GDP, 1995



Source: *Beyond Economic Growth* (World Bank)

Current situation and trends

Economy

World production of goods and services (over US$ 30 trillion in current dollars) has more than doubled since 1975.[2] Most growth in wealth has taken place in countries that are already comparatively rich (**Figure 1**). By contrast, in Sub-Saharan Africa (the world's poorest region, but one in which there is high population

Table 1
World's 15 largest multinationals,[a] 1999

Ranking by: Foreign assets	Ranking by: TNI[b]	Corporation	Country	Industry[c]	Assets: Foreign	Assets: Total	Sales: Foreign	Sales: Total
1	75	General Electric	United States	Electronics	141.1	405.2	32.7	111.6
2	22	Exxon Mobil Corporation	United States	Petroleum expl./ref./distr.	99.4	144.5	115.5	160.9
3	43	Royal Dutch/Shell Group[d]	The Netherlands/United Kingdom	Petroleum expl./ref./distr.	68.7	113.9	53.5	105.4
4	83	General Motors	United States	Motor vehicles	68.5	274.7	46.5	176.6
5	77	Ford Motor Company	United States	Motor vehicles	...	273.4	50.1	162.6
6	82	Toyota Motor Corporation	Japan	Motor vehicles	56.3	154.9	60.0	119.7
7	51	DaimlerChrysler AG	Germany	Motor vehicles	55.7	175.9	122.4	151.0
8	21	Total Fina SA	France	Petroleum expl./ref./distr.	...	77.6	31.6	39.6
9	50	IBM	United States	Computers	44.7	87.5	50.4	87.6
10	18	BP	United Kingdom	Petroleum expl./ref./distr.	39.3	52.6	57.7	83.5
11	2	Nestlé S.A.	Switzerland	Food/beverages	33.1	36.8	45.9	46.7
12	45	Volkswagen Group	Germany	Motor vehicles	...	64.3	47.8	70.6
13	11	Nippon Mitsubishi Oil Corporation (Nippon Oil Co. Ltd)	Japan	Petroleum expl./ref./distr.	31.5	35.5	28.4	33.9
14	41	Siemens AG	Germany	Electronics	...	76.6	53.2	72.2
15	90	Wal-Mart Stores	United States	Retailing	30.2	50.0	19.4	137.6

a) ranked by foreign assets (in US$ billion); excludes financial institutions
b) TNI = transnationality index, calculated as the average of three ratios: foreign assets to total assets, foreign sales to total sales, foreign employment to total employment
c) using US Standard Industrial Classification
d) foreign asset, sales and employment data exclude Europe
Source: *World Development Report 2001* (UNCTAD).

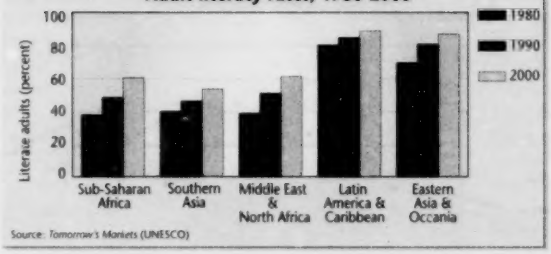
growth) gross domestic product per capita has shrunk.

Many researchers are studying the relationship between income inequality and development. It is increasingly accepted that reducing the income gap is not only desirable from a social standpoint, but also a prerequisite for long-term business growth.[3]

In terms of value added, industry accounts for nearly one-third of world GDP and the service sector for most of the rest. Agriculture represents barely 5%. The shares of the industrial and farming sectors have essentially been declining since at least the 1960s.[4]

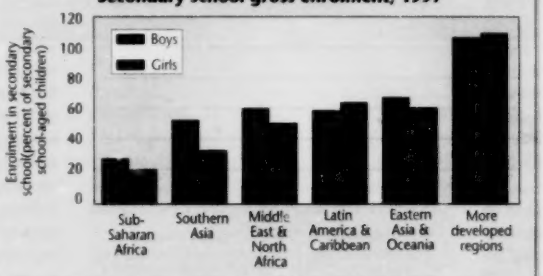
The public sector's weight in GDP has been growing throughout the world for decades, despite a trend in recent years towards privatization of state enterprises. In developed and transition countries, where this trend has been most marked, public sector shares of GDP are generally higher than in developing countries[5] (**Figure 2**). However, even in the developed world the private-public split differs considerably: in France it is about 50-50, in Ireland roughly 66-33[6] and in the United States 72-28.[7] A new study suggests that expansion of government is due to "the state's unique ability to reallocate risk".[8]

Figure 3
Adult literacy rates, 1980-2000



Source: *Tomorrow's Markets* (UNESCO)

Figure 4
Secondary school gross enrolment, 1997



Note: Gross enrollment ratios can exceed 100% due to the inclusion of over-aged and under-aged students

Source: *Tomorrow's Markets* (UNESCO)

Human development

GDP is increasingly considered an inadequate indicator in that it does not reflect other elements of wealth, such as human and environmental capital. Thus, indicators to complement GDP are being developed (**Figures 3-5**).

Income level is closely related to primary school enrolment rates, with lower-income children underrepresented in many countries. This leads to a vicious circle, as the correlation between education level and adult earnings is equally clear.

One result of the shift to a service economy is increased opportunities for women. The proportion of working-age women in the formal labour force is growing in most countries for which data are available – even though women are often handicapped in the labour market by factors such as limits on the kinds of employment available to them, training/education gaps, lower seniority (i.e. greater vulnerability to layoffs) and the need to take time off for childbearing.[9]

Worldwide about half of all women work, while they make up about one-third of the total workforce. They receive less than one-fifth of total wages and earn about two-thirds what men do in comparable jobs.[10]

Progress has been made in reducing child labour, especially since the International Labour Organization began a campaign on this issue ten years ago. The ILO reported in May that some 246 million children between the ages of five and 17 (one-sixth of that age group) hold jobs inappropriate for their age; of those, around 179 million do work that endangers their physical, mental or moral well-being.

The ILO is also attempting to improve statistics on occupational diseases, injuries and deaths. Its current rough estimates (worldwide) are as follows: 14 out of 100,000 workers per year die from occupational injuries; altogether nearly a million deaths per year are due to work-related diseases; and the economic costs of occupational injuries and diseases represent the equivalent of around 4% of GDP.

Globalization

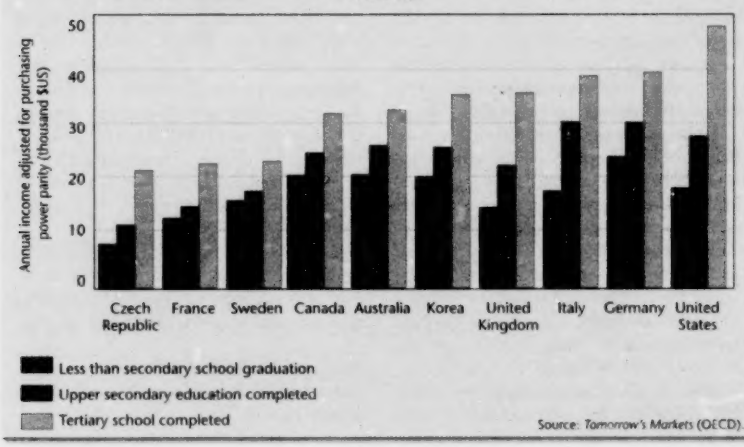
Business, particularly when conducted by multinational (or "transnational") corporations, is a key vehicle for the phenomenon known as "globalization": the increasing worldwide flows of money, goods, services, people, information, communications, culture, etc.

In the latest UN Conference on Trade and Development ranking of multinational companies, the top 47 (by foreign assets) are based in the developed world. A comparison of the top 15 worldwide multinationals and the developing world's top 15 (**Tables 1 and 2**) is as notable for similarities as for differences. For instance, oil and automotive companies dominate the former; while oil is present on the latter list, the largest category is diversified conglomerates.

Multinationals play a major role in foreign direct investment. World inflows of FDI hit a record of nearly US$ 1.3 trillion in 2000, with most (just over US$ 1 trillion) going to developed countries.[11]

Another vehicle of globalization is information and communications technology (ICT). Use of telephones (both fixed and mobile) grew 86% worldwide between 1996 and 2000, to 286 phones per 1000 people. The number of personal computer numbers grew 62% during the same period, to 78 per 1000 people; the number of internet users increased over sixfold, to more than 366 million. Geographic distribution is very uneven.[12]

Figure 5
Average earnings and education level, selected countries, 1997-99

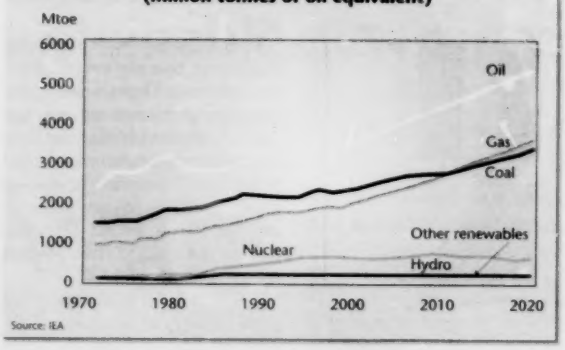


Source: *Tomorrow's Markets* (OECD)

Energy

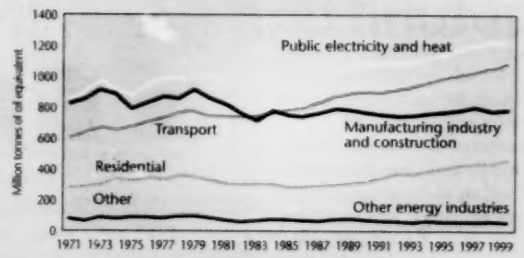
The richest 20% of the world's people consume over half the world energy supply, while the poorest 20% consume only 5%. The World Energy Assessment, a joint effort of the UN Development Programme, the UN Department of Economic and Social Affairs and the World Energy Council,

Figure 6
World primary energy supply, 1970-2020 (forecast)
(million tonnes of oil equivalent)



Source: IEA

Figure 7
Energy demand in IEA countries,[a] 1971-99
(million tonnes of oil equivalent)



a) The 26 member countries of the International Energy Agency: all OECD countries except Iceland, Mexico, Poland and Slovakia.

Source: IEA

estimates that 2 billion people have no access to electricity and that, for a further 2 billion, access to power is unreliable. This puts worldwide per capita electricity use (more than 2000 kWh in 1999) into perspective.

In the past three decades, largely thanks to increased energy efficiency in some countries, world energy supply has been rising at a slightly lower rate than GDP. Between 1980 and 2000 global energy output rose 42%, to 9352 million tonnes of oil equivalent. In all regions the carbon-rich fossil fuels (chiefly coal, oil and natural gas) and their derivatives account for over half of energy supply; in Europe, North America and the Middle East they account for over three-quarters.[13]

Overall energy use in industry has been decreasing (despite increases in some sectors, e.g. iron and steel). Energy use in transport, particularly road transport, is growing. Household energy use is increasing rapidly worldwide.[14]

According to a recent RIVM (Netherlands Institute of Public Health and the Environment) report, energy receives a worldwide total of US$ 240 billion per year in public subsidies, representing one-quarter of all state subsidies. RIVM considers "perverse" subsidies one of the main causes of unsustainable development.[15]

The International Energy Agency (IEA) has estimated that removing price-distorting energy subsidies in eight major developing countries would reduce demand enough to lower these countries' energy use by 13%, worldwide energy use by 3.5% and global CO_2 emissions by 4.6%.[16]

Energy use, especially burning of fossil fuel, directly affects local air quality (see below) and the global climate. In March of this year the US Energy Information Administration warned that world oil demand was growing 2.2% per year on average, a rate that would translate to an extra 3.8 billion tonnes of CO_2 emissions per year by 2020. Most of this increase would be for transport in the developing world. Oil's share of the world energy supply is not expected to grow significantly (remaining at around 40%) as countries seek alternatives to oil for electricity generation.[17]

Renewable energy sources such as wind, sun, biomass and geothermal are playing an increasingly important role (**Figure 9**). Renewables now account for around 11.5% of world energy use. Wind power is the fastest growing form of electricity generation worldwide, though its share of consumption is now only about 1%. A Danish consulting firm recently forecast that the wind power market would grow 16% in the next five years.[18]

Air and water

The latest available pollution figures for OECD countries show that transport and industry are responsible for significant shares of conventional air pollutants: in 1997, 85% of carbon monoxide

State of the world's environment and progress towards sustainability

It has been estimated that the number of people affected by disasters climbed from an average of 147 million per year in the 1980s to an average of 211 million per year in the 1990s. Global financial losses from natural disasters in 1999 have been estimated at over US$ 100 billion. Weather-related disasters are becoming more severe: 90% of deaths resulting from disasters in the 1990s were caused by events such as floods, windstorms and droughts.

India loses over US$ 10 billion per year due to environmental degradation (the equivalent of 4.5% of its GDP). Human induced land degradation in India is responsible for productivity losses of around US$ 2.4 billion per year.

The Montreal Protocol was adopted in 1987. Production of the main chlorofluorocarbons (CFCs) destroying the ozone layer peaked in 1988 and is now at very low levels. Over US$ 1.1 billion has been provided to assist 114 developing countries in phasing out ozone depleting substances. By 2000 total consumption of such substances had been reduced by 85%.

One-fifth of the world population accounts for nearly 90% of total personal consumption. Some 4 billion people survive on less than a dollar or two per day.

Around half the world's rivers are seriously depleted and polluted. About 60% of the 227 largest rivers have been strongly or moderately fragmented by dams and other engineering works, which have displaced between 40 million and 80 million people since the 1950s.

Global production of roundwood exceeds 3 billion cubic metres. Around half of this wood is used for fuel. Commercial logging methods in West Africa destroy about two cubic metres of trees to produce one cubic metre of logs.

By the end of 2000 about 2% of world forests had been certified for sustainable management under programmes such as those operated by the Forest Stewardship Council. Most of these programmes are in Canada, Finland, Germany, Norway, Poland, Sweden and the United States.

Up to one-half of recent mangrove destruction has resulted from clear cutting for shrimp farms.

By 1994 an estimated 37% of the human population (more than the total number of people alive in 1950) lived within 60 kilometres of a coast.

The global economic impact of marine contamination, measured in terms of human health effects, may amount to nearly US$ 13 billion per year. Some 25,000 people per year suffer long-term disability due to liver damage from infectious hepatitis caused by consumption of contaminated shellfish. In 1991-92 fish farmers in the Republic of Korea sustained US$ 133 million in economic losses as a result of toxic algal blooms ("red tides") triggered by nutrients.

Just under one-third of the world's fish stocks are designated as depleted, overexploited or recovering as a result of overfishing stimulated by subsidies estimated at up to US$ 20 billion per year.

Findings taken from Global Environment Outlook 3. See UNEP Focus (page 42) and Books and Reports, page 48.

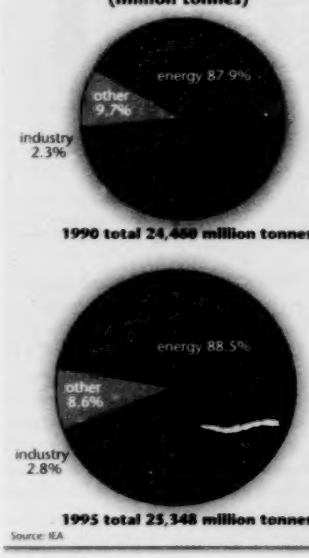
emissions were from transport; 65% of sulphur oxides were from industry; 52% of nitrogen oxides were from transport and 11% from industry; and 44% of volatile organic compounds were from transport and 29% from industry.[19] Although industrialized world emissions have largely been falling for at least two decades, those of the developing world are rising and project to continue doing so.[20]

Industry is also implicated in water quality problems. Its impact on the world level is expected to increase dramatically in the years to come, as developing countries industrialize. Other major sources of water pollution are agriculture and waste water disposal; one key water quality indicator, for instance, is the percentage of the population connected to public waste water treatment plants.[21] The relationship between water quality and water quantity, including the role of water use efficiency in reducing water pollution problems, is increasingly being studied.

Water scarcity is becoming a crucial issue in much of the world. On World Water Day, in March, the Secretary-General of the World Meteorological Organization pointed out that global water demand grew nearly sevenfold just over 1990-95 – more than twice the rate of population growth.[22] Some 41% of the world's people live in areas categorized as "water stressed" – that is, with freshwater resources per capita of less than 1700 cubic metres per year.[23]

Lack of access to safe water and the concomitant implications for health especially affect rural areas (**Figure 10**). Agriculture is not only an important non-point source of pollution, but it also accounts for some 70% of all freshwater withdrawal worldwide.[24]

Figure 8
Industry and energy sector CO_2 emissions, 1990 and 1995 (million tonnes)



Source: IEA

Waste

Waste generation and disposal are also matters of increasing concern, but this is an area where data availability is a particular problem. One reason is that definitions of municipal waste, industrial waste, construction and demolition waste, hazardous waste, etc.; vary considerably even among the countries where record-keeping is the most developed. It is clear that many waste streams are increasing in volume, and that increased affluence tends to mean higher waste generation per capita.[25]

One effect of this trend is growth in the trade of waste, which is of particular concern as regards hazardous waste. To date, 149 countries have ratified the Basel Convention on transboundary movements of hazardous waste (the United States,

Short glossary of sustainability and the World Summit

Agenda 21: Action plan adopted at the Rio Earth Summit. It is meant to be followed globally, nationally and locally by organizations of the United Nations system, governments and major groups wherever human activities affect the environment.

Civil society: Variously defined as a) non-governmental organizations, b) NGOs and trade unions, c) NGOs, unions and business organizations, or d) everything except government and the military. See "major groups" below.

Commission on Sustainable Development (CSD): A body of the UN Economic and Social Council (ECOSOC) with 53 members, formed in December 1992 to assure follow-up to the Rio summit.

Corporate social responsibility (CSR): In *Making Good Business Sense* the World Business Council for Sustainable Development (WBCSD) defines corporate social responsibility as a "continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large." CSR is understood to include an environmental component.

Global Compact: A voluntary initiative proposed in 1999 by UN Secretary-General Kofi Annan and formalized the following year. Its aim is to provide a forum in which companies can help each other learn to identify and disseminate good practices based on nine principles drawn from the Universal Declaration of Human Rights, the ILO's Fundamental Principles on Rights at Work and the Rio Principles on Environment and Development.

Global Reporting Initiative (GRI): An international effort to develop and disseminate sustainability reporting guidelines that would be applicable worldwide. It will set up a permanent secretariat in Amsterdam this year and is expected to become a UNEP collaborating centre.

Major groups: Groups defined in Agenda 21 as those whose participation in decision making should be assured. They are: women, children and youth, indigenous people, NGOs, local authorities, trade unions, business and industry, the scientific and technological community, and farmers.

Millennium goals: Global targets set in the Millennium Declaration issued in September 2000 at the close of the Millennium Summit at United Nations Headquarters. They include halving extreme poverty and hunger; achieving universal primary education and gender equity; reducing under-five mortality by two-thirds and maternal mortality by three-quarters; reversing the spread of HIV/AIDS; halving the proportion of people without access to safe drinking water; ensuring environmental sustainability; and developing a global partnership for development (with targets for aid, trade and debt relief).

PrepCom: The CSD meeting as the Preparatory Committee for the World Summit on Sustainable Development. There have been four such meetings (PrepCom 1, PrepCom 2, etc.).

Rio Summit: The 1992 the UN Conference on Environment and Development (UNCED) in Rio de Janeiro. Also called the Earth Summit.

Stakeholder: Any entity or individual trying to shape the resolution of a given issue (adapted from a definition by the New York consulting firm Decision Insights). Anyone experiencing or expecting to experience actual or potential harm and/or benefit as a result of a firm's [government's, organization's, etc.] actions or inaction (adapted from T. Donaldson and L.E. Preston, "The stakeholder theory of the corporation," *Academy of Management Review*, January 1995).

Triple bottom line: A way to measure and report corporate performance using economic, social and environmental parameters. More broadly, the whole set of values, issues and processes that companies must address to minimize harm resulting from their activities and to create economic, social and environmental value (adapted from definitions used by the London consulting firm SustainAbility).

Figure 9
Global solar and wind energy production, 1980-97

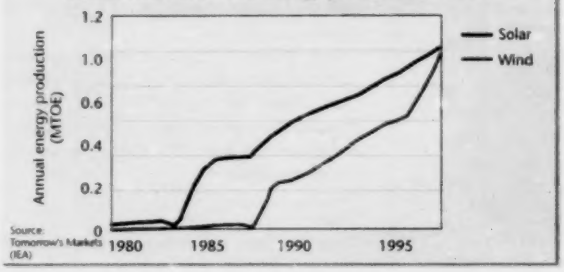
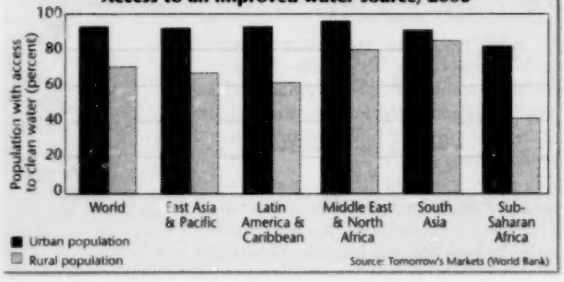


Figure 10
Access to an improved water source, 2000



Haiti and Afghanistan have signed but not ratified it), a central goal of which is to minimize hazardous waste generation.

Affluence brings greater consumption and different consumption patterns. The shares of such necessities as food, clothing and fuel tend to drop, while goods and services that might be said to enhance the quality of life claim larger amounts of household income. Waste generation is not the only consequence of increases and changes in consumption: rising levels of protein in the diet, for instance, can lead to more land use changes, water pollution, erosion and overfishing; higher production of goods such as cars and household appliances puts pressure on natural resources.[26]

Responses

Multilateral agreements

Before the increased awareness of nuclear issues in the 1960s, the main multilateral environmental agreements largely concerned fishing, shipping, marine pollution and trade. Control of consumer products, including hazardous substances, began to be addressed in the late 1960s and early 1970s, principally in the form of regional accords. Wildlife dominated the 1970s agenda, including as a key motivation for agreements on marine pollution. In the late 1970s regional freshwater and air quality entered the picture, along with shipments of hazardous waste. Many people consider the 1985 Vienna Convention on Protection of the Ozone Layer the first agreement on a truly global issue.

The period leading up to and following the Rio summit saw a spate of agreements on issues more directly affecting business (e.g. regional accords on environmental impact assessment and industrial accidents and, less directly, the UN climate change and desertification conventions). In recent years there have been agreements on international control of hazardous substances. Meanwhile, throughout this entire period, trade and maritime issues have continued to receive the attention of international lawmakers.

The first mention of sustainable development as such appears in the 1987 ASEAN Resolution on Sustainable Development, an example of what is sometimes called "soft law" (essentially, non-binding measures). Distinguishing between environmental law and sustainable development law is often difficult; some commentators feel the latter has become the overarching category. UNEP's 1997 Nairobi Declaration mentions "international environmental law aiming at sustainable development".[27]

National legislation and enforcement

Very generally speaking, national environmental legislation in many of the major developed economies is gradually moving – albeit slowly in places, and not without many hiccups – towards an integrated approach aimed at incorporating sustainable development principles and economic instruments. As can be seen in the OECD Environmental Performance Review series of country studies, compliance with (and enforcement of) national legislation varies considerably by country and even by administrative subdivision; though a correlation with income exists, other factors (often cultural) can play a strong role.

In recent years the transition economies, which could generally be said to have started the 1990s about where the "rich" countries were 20 years earlier, have been in a position to profit from the integration model. However, some (e.g. the Czech Republic) have done so to a far greater degree than others. Legislation and enforcement tend to be much weaker in developing countries, where they exist at all, but this need not mean a "race to the bottom". Some studies have indicated that as FDI inflows and income rise, pollution tends to decline.[28]

Table 2
Developing world's 15 largest multinationals,[a] 1999

Ranking by:					Assets		Sales	
Foreign assets	TNI[b]	Corporation	Country	Industry[c]	Foreign	Total	Foreign	Total
1	24	Hutchison Whampoa Limited	Hong Kong, China	Diversified	...	48,157	2096	7108
2	30	Petroleos De Venezuela	Venezuela	Petroleum expl./ref./distr.	8009	47,250	13,332	32,600
3	10	Cemex S.A. (Cementos Mexicanos S.A.)	Mexico	Construction	6973	11,896	2504	4841
4	39	Petronas – Petroliam Nasional Berhad	Malaysia	Petroleum expl./ref./distr.	...	31,992	...	15,957
5	34	Samsung Corporation	Korea, Republic of	Diversified/Trade	5127	21,581	6339	37,180
6	13	Daewoo Corporation	Korea, Republic of	Diversified/Trade	...	16,460	...	48,618
7	22	Lg Electronics Inc.	Korea, Republic of	Electronics and electrical equipment	4215	17,273	6383	15,590
8	45	Sunkyong Group	Korea, Republic of	Energy/Trading/Chemicals	4214	34,542	10,762	43,457
9	43	New World Development Co., Ltd	Hong Kong, China	Construction	4097	14,789	368	2259
10	42	Samsung Electronics Co. Ltd	Korea, Republic of	Electronics and electrical equipment	3907	25,487	5214	28,024
11	3	Neptune Orient Lines Ltd.	Singapore	Transportation	3870	4184	4101	4267
12	6	Sappi Ltd.	South Africa	Pulp and paper	3643	5428	3425	4422
13	8	First Pacific Co., Ltd.	Hong Kong, China	Electronics and electrical equipment	3482	6797	965	1232
14	49	Petrolero Brasileiro SA Petrobras	Brazil	Petroleum expl./ref./distr.	3293	33,733	1542	16,358
15	19	Jardine Matheson Holdings Ltd.	Hong Kong, China	Diversified	2865	9904	7489	10,655

a) ranked by foreign assets (in US$ billion); excludes financial institutions

b) TNI = transnationality index, calculated as the average of three ratios: foreign assets to total assets, foreign sales to total sales, foreign employment to total employment

c) using US Standard Industrial Classification

Source: *World Development Report 2001* (UNCTAD).

Market-based and economic instruments

Hard experience with trading of emission/discharge credits, permits or quotas dates back little more than a decade. This market-based approach to pollution control is being applied to greenhouse gas emissions (see World News) and is under discussion for such hard-to-tackle problems as diffuse pollution by nutrients.[29] Supporters of the market-based approach say it fulfils the purpose of the polluter pays principle and is more effective than regulation in the long run. Critics object to making pollution a commodity and point out the potential for cheating.

Tradable or transferable fishing quotas are another widely used market-based instrument. They are credited with helping protect fisheries and the livelihoods of those exploiting them.

In many programmes requiring electricity suppliers to use a certain percentage of renewable-based power, suppliers can instead choose to buy credits or certificates, which are generally priced higher than the incremental cost of renewable-based electricity. A related fiscal instrument attributes tax credits for renewable-based electricity generation – more or less the opposite of carbon taxes, levied against fuels' carbon content, which have proved much less acceptable politically.

Still, effective carbon taxes are being used in the Scandinavian countries. The Worldwatch Institute's *State of the World 2002* reports that Norway's 1991 carbon tax has so far cut power plants' carbon emissions by 21%. It also reports that 19 industrialized countries are planning fiscal reform measures that would affect greenhouse gas emissions, and that 11 of these measures are carbon or emission taxes. Part of the goal is to apply the polluter pays principle.

Voluntary initiatives/codes of conduct

Voluntary agreements involving business and (usually) governments predate the 1992 Rio summit, but they have been used increasingly since then. There are many types of VAs, including:

- commitments by individual companies;
- codes of conduct adopted at national or international level by industry associations;
- agreements on environmental performance targets negotiated between a government and a company, a group of companies or an entire sector.

According to the OECD, recent surveys indicate that over 300 negotiated environmental agreements exist in the European Union, Japan has some 40,000 local pollution control agreements and the US Government manages more than 40 federal-level voluntary programmes.[30]

State of the World 2002 reports that around 21 voluntary agreements were initiated in 1999 alone, including four in the power generation industry, two in transport and 11 in general industry and manufacturing. It notes that they range from strong (with the threat of regulation if partners do not comply) to "cooperative" (relying on incentives to develop and deploy new technology).

Agenda 21 mentions the chemical industry's Responsible Care® programme as a way to promote good environmental practices. Responsible Care began in the early 1980s in Canada and was adopted in 1988 in the US, in response to the Bhopal disaster in 1984. According to the American Chemistry Council, 46 national associations representing over 85% of the world's chemical production, are in various stages of implementing Responsible Care. Another example is the code of conduct of the World Federation of the Sporting Goods Industry, adopted in 1997 and revised in 2000 (see *www.wfsgi.org/SGI/activities/Code_Conduct.htm*).

At UNEP's instigation, sectoral initiatives have been established or are being developed in the financial sector (one for financial institutions and another for insurance and related activities, the former involving over 170 companies and the latter over 90), tourism (25 companies), ICT (13 companies), and the automotive, advertising and gold industries (proposed or under development).

The UNEP International Declaration on Cleaner Production has been signed by 47 coun-

Selected environmental events and agreements, 1972-2002

1972	UN Conference on the Human Environment, Stockholm
	Establishment of UNEP
	UNESCO World Heritage Convention
1973	*Convention on International Trade in Endangered Species
1976	Seveso industrial disaster, Italy
1977	Love Canal disaster, United States
	UN Conference on Desertification, Nairobi
1979	First World Climate Conference, Geneva
	Convention on Conservation of Migratory Species of Wild Animals
1980	Brandt Commission's *North-South: A Programme for Survival*
1982	UN Convention on the Law of the Sea
1984	Bhopal disaster, India
	World Industry Conference on Environmental Management
1985	*Vienna Convention on Protection of the Ozone Layer
1986	International Whaling Commission moratorium on commercial whaling
1987	*Montreal Protocol on Substances that Deplete the Ozone Layer
	Brundtland Commission's *Our Common Future*
1989	*Basel Convention on Transboundary Movements of Hazardous Waste
	Establishment of Intergovernmental Panel on Climate Change
1990	Adoption of eco-efficiency as a goal for industry
	Second World Climate Conference, Geneva
1991	Establishment of Global Environment Facility
1992	UN Conference on Environment and Development, Rio de Janeiro
	*Convention on Biological Diversity
	Framework Convention on Climate Change
1994	UN Convention to Combat Desertification
1995	World Business Council for Sustainable Development
1996	ISO 14000 environmental management standard
1997	Kyoto Protocol
1998	*Rotterdam Convention on Prior Informed Consent
2000	*Cartagena Protocol on Biosafety
2001	*Stockholm Convention on Persistent Organic Pollutants
2002	World Summit on Sustainable Development

* = initiated and/or administered by UNEP

Source: Adapted from GEO-3

tries, 20 subnational governments, 106 companies and 144 business associations, NGOs and other organizations since it was launched in 1998.

Corporate responsibility and accountability

In 1989 several socially responsible investment firms and public pension funds joined leading environmentalists in a bid to change corporate environmental practices. The resulting Coalition for Environmentally Responsible Economies (CERES) drew up a set of principles shortly after the *Exxon Valdez* oil spill the same year. What would come to be called the CERES Principles comprised a ten-point code of corporate environmental conduct, which companies working to improve their performance were asked to publicly endorse. In 1993, Sunoco became the first Fortune 500 company to endorse the CERES Principles.

In 1997 CERES and UNEP established the Global Reporting Initiative to design globally applicable guidelines for preparing reports on the environmental, social and economic impact of corporate activities. The GRI's revised Sustainability Reporting Guidelines on Economic, Environmental and Social Performance were released in June 2000.

In July 2000 UN Secretary-General Kofi Annan launched the Global Compact, challenging businesses to support a precautionary approach to environmental challenges, undertake initiatives to promote greater environmental responsibility, and encourage the development and diffusion of environmentally friendly technologies, among other objectives.

At least 112 companies are known to be using the GRI guidelines, and several hundred companies have pledged to support the Global Compact; 126 companies, organizations and institutions are certified as having fulfilled its initial requirements in 2001. The two initiatives have set up a cooperative framework in which company submissions made under the aegis of the GRI are considered as fulfilling the Global Compact requirements.

Business-founded groups promoting corporate social responsibility include the World Business Council for Sustainable Development (*www.wbcsd.ch*), with 150 corporate members, and the International Business Leaders Forum (*www.iblf.org*), whose more than 60 members are CEOs of multinational companies. The IBLF runs the web-based Corporate Social Responsibility Forum (*www.ihei.org/csr/csr-webassist.nsf/content/e1. html#leading*).

A new French law, one of the most significant developments so far in regard to sustainability reporting, requires all major French corporations to report on the social and environmental effects of their activities starting with their 2003 annual reports (for the 2002 financial year).

Table 3
FDI inflows, by region, 1998-2001 (US$ billion)

Region[a]	1998	1999	2000	2001[a]
World	693	1075	1271	760
Developed countries	483	830	1005	510
Developing countries[b]	188	222	240	225
Africa[c]	8	9	8	10
Latin America and the Caribbean	83	110	86	80
Asia and the Pacific	96	100	144	125
South, East and South-East Asia	86	96	137	120
Central and Eastern Europe including the countries in the former Yugoslavia	21	23	25	25
	22	25	27	27

a) preliminary estimates as of 3 September 2001
b) including the countries which were formerly part of Yugoslavia
c) if South Africa is included the figures are 8, 10, 9 and 11, respectively
Source: UNCTAD FDI/TNC database

Table 4
ICT use in selected countries, 2000

	Telephones 1000 people	Computers 1000 people	Internet users
Brazil	318	44	5 million
Czech Republic	762	122	1 million
Finland	1270	396	19.3 million
Greece	1089	71	1 million
India	39	4.5	5 million
Kuwait	493	131	150,000
Republic of Korea	1031	238	19 million
Mozambique	7	3	30,000
Peru	112	41	2.5 million
Senegal	48	17	40,000

Source: World Bank Development Data Group

NGOs

Environmental non-governmental organizations essentially date back to Victorian Britain, but their numbers and roles have expanded greatly in recent decades. At Rio in 1992 more than 8000 NGO members participated; later this summer in Johannesburg some 40,000 are expected.

The REC NGO Directory of environmental organizations working in Central and Eastern Europe, updated in 2001, contains contact information for over 2700 organizations from 15 CEE countries. The OECD has published directories of 1905 NGOs in the field of sustainable development in Australia, Canada, Japan, Korea, New Zealand and the United States; an earlier volume listed 3900 sustainable development NGOs in Europe.

Labour

Workers and trade unions constitute one of the major groups mentioned in Agenda 21, which calls for strengthening their role in working for sustainable development. Trade unions have been extending their traditional occupational health and safety concerns in recent years to include the environment. They have also been forming alliances with environmental and sustainability NGOs, such as Earthworker in Australia and the Blue/Green Alliance in the United States.

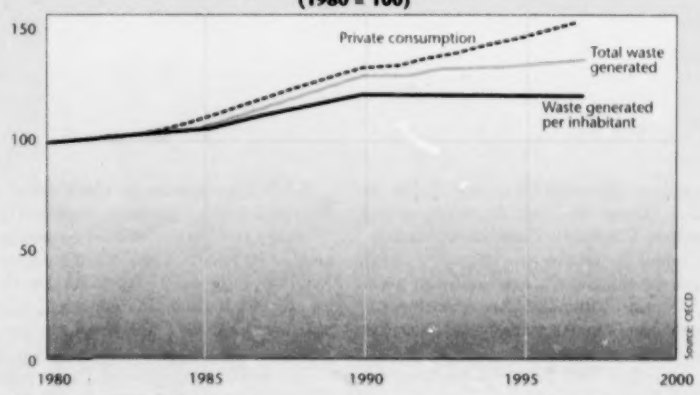
Unions have been involved in introducing such environmental management tools as environmental audits and cost-benefit analysis that incorporates social and environmental costs. Inside and outside the workplace, they have been particularly involved in climate change and global warming issues.

Another issue of importance to labour is environmentally sustainable jobs. The International Federation of Chemical, Energy, Mine and General Workers' Unions (ICEM) organized the world's first trade union conference on "green jobs" in 1996. Ten US unions have formed a group called Unions for Jobs and the Environment, whose main activity is a web site (*www.ujae.org*).

Sustainability in higher education

In the long term, education may offer the best hope for making sustainability a reality. Among the many organizations endorsing this view is the US-based University Leaders for a Sustainable Future (*www.ulsf.org*), whose aim is to make sustainability a major focus of teaching, research, operations and outreach at colleges and universities worldwide. ULSF is also the repository of the

Figure 11
Index of municipal waste generation, OECD, 1980-2000 (1980 = 100)



1990 Talloires Declaration, a ten-point action plan for incorporating sustainability and environmental literacy in teaching, research and other operations of higher education institutions. The Declaration has been signed by over 275 university presidents and chancellors in more than 40 countries.

ULSF works closely with Copernicus (*www.copernicus-campus.org*), a European programme that cooperates with industry, governments, international organizations and other groups to raise awareness of the need to make sustainability a major focus of higher education. There are over 300 institutional members in almost 40 countries.

Figure 12
Signatories of the Declaration on Cleaner Production, by region

Source: UNEP Production and Consumption Branch

Notes

1. Hereafter referred to as "business".
2. World Bank, *World Development Indicators 2001*.
3. UNEP, WBCSD, WRI, *Tomorrow's Markets: Global Trends and Their Implications for Business, 2002*; see, for example, G.A. Cornia and J. Court, *Inequality, Growth and Poverty in the Era of Liberalization and Globalization*, World Institute for Development Economics Research, United Nations University, Helsinki.
4. World Bank.
5. T.P. Soubbotina and K.A. Sheram, *Beyond Economic Growth: Meeting the Challenges of Global Development*, World Bank, 2000.
6. European Commission.
7. The White House, Washington, D.C.
8. *The Economist*, 11 May 2002, reporting on David A. Moss, *When All Else Fails: Government as the Ultimate Risk Manager*, Harvard University Press, 2002.
9. ILO.
10. *Tomorrow's Markets*.
11. UNCTAD, *World Investment Report 2001*.
12. World Bank.
13. IEA.
14. *Ibid.*
15. A. de Moor, *Towards a Grand Deal on Subsidies and Climate Change*, Netherlands Institute of Public Health and the Environment (RIVM), 2001.
16. IEA, *World Energy Outlook* 1999.
17. Planet Ark news service.
18. BTP, Planet Ark.
19. *OECD Environmental Outlook*, 2001.
20. *Tomorrow's Markets*.
21. OECD, *Key Environmental Indicators*, 2001.
22. Planet Ark.
23. *Tomorrow's Markets* (using the widely accepted Falkenmark-Widstrand definition).
24. *Ibid.*
25. *Key Environmental Indicators*.
26. *Tomorrow's Markets*.
27. P. Birnie and A. Boyle, *International Law and the Environment* (2nd ed.), Oxford University Press, 2002.
28. See, for example, D. Wheeler, *Prospects for an Environmental Race to the Bottom*, World Bank, 2000.
29. See, for example, P. Faeth, *Fertile Ground: Nutrient Trading's Potential to Cost-Effectively Improve Water Quality*, World Resources Institute, 2000, and the WRI nutrient trading web site (*www.nutrientnet.org*).
30. J.-P. Barde, Foreword to P. ten Brink (ed.), *Voluntary Environmental Agreements: Process, Practice and Future Use*, Greenleaf Publishing, 2002. ◆

What can business bring to the World Summit on Sustainable Development?

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Summary

Business has found partnerships essential for progress towards sustainable development. The trust required to build working partnerships can be enhanced through setting targets and reporting openly against them. Getting large and small businesses into areas where there is currently no economic activity contributes to sustainable development. Markets are important, but so are regulatory frameworks. Voluntary initiatives push forward the boundaries. While international frameworks are necessary with respect to global trade, finance and environment, business needs to work with others to ensure that governance in each individual country and business improves in line with the fundamental standards expressed in the Global Compact.

Résumé

Le monde des affaires estime les partenariats essentiels pour progresser en direction du développement durable. La confiance nécessaire pour bâtir des partenariats efficaces peut être améliorée si des objectifs sont fixés et si les résultats correspondants sont ouvertement communiqués. Amener les petites et les grandes entreprises dans des régions où il n'y a actuellement aucune activité économique est un moyen de contribuer au développement durable. Les marchés sont certes importants, mais le contexte réglementaire l'est tout autant. Les initiatives volontaires permettent de repousser les limites. Si des structures internationales sont nécessaires dans le domaine des échanges mondiaux, de la finance et de l'environnement, l'entreprise doit travailler avec le monde autour d'elle pour faire progresser la gouvernance dans chaque pays et entreprise conformément aux normes fondamentales exposées dans le « Pacte mondial ».

Resumen

Los empresarios han descubierto que es imprescindible asociarse para progresar en dirección al desarrollo sustentable. La confianza que se requiere para la constitución de asociaciones laborales se puede reforzar fijando metas y denunciándolas públicamente. Establecer pequeñas y grandes empresas en áreas donde actualmente no hay actividad económica contribuye al desarrollo sustentable. Tanto los mercados como los marcos regulatorios son importantes. Las iniciativas voluntarias desplazan los límites. Mientras que los marcos regulatorios internacionales son necesarios para el comercio, las finanzas y el manejo del medio ambiente a nivel mundial, las empresas necesitan trabajar con otros para asegurar la gobernabilidad en cada país individual y lograr impulsar las transacciones comerciales en conformidad con los estándares principales del Pacto.

In the ten years since Rio business has learned a great deal, delivered a lot, and, I believe, made considerable progress. In this article I want to discuss some of the lessons learned, but also to look forward to what more we as business need to do. The WSSD in Johannesburg is an excellent opportunity for all of us not just to take stock, but to look at what we need to do together to achieve the Millennium goals.

The International Chamber of Commerce (ICC) and the World Business Council for Sustainable Development (WBCSD) have set up Business Action for Sustainable Development (BASD), not as an organization but as an initiative to forward the business contribution to WSSD. BASD also interacts with the Business Coordinating Forum (BCF) in South Africa, which coordinates business contributions at the local level. The opportunity given to business to participate (with other major groups) in the regional Ministerial Prepcoms and the CSD Preparatory process is very encouraging. It reflects a timely realization of the need to address all three pillars of sustainable development. It is essential that the economic leg of the sustainable development tripod should be healthy, and that the views of business on how to make sure health is maintained – and on governance for sustainable development, including tracking performance and ensuring delivery – are of value.

Working together

While business traditionally focuses on the economic leg, during the last ten years we have also come to realize that our contribution to the other two legs of sustainable development – the environment and society – is also essential. A major business with excellent economic performance that damages the environment will be punished in the marketplace. Likewise, if the activities of business are not seen to benefit society at large (not just their shareholders or customers), they become unsustainable in the long run. A business that is not economically sound, however good its environmental and social performance, ceases to be a business and shortly thereafter ceases to exist. Each of the three legs of sustainability has importance, and it is critical to realize that they are not substitutable. Outstanding performance in one does not compensate for underperformance in another. We need to make sure that all three legs are strong; otherwise, the tripod falls over.

In 2001 WBCSD, representing the broad views of some 30 national and regional business organizations and some 700 business leaders around the world, produced a document called "The Business Case for Sustainable Development", reflecting a belief that sustainable development is also good business.

This is easy to say, but not so easy in practice. How does a business set about improving its sustainability? And how can society ensure that the sustainability of business activities in general is continuously improved?

First, a business cannot do it on its own. Partnership is at the very heart of the matter. A business must consciously and openly consult and work with those involved and affected, not just its customers. In the past those of us in business may have thought we could handle the economic leg, with a close eye on what our customers want. But if we are to address the environmental and social legs, we need the input of others. For example, scientists and environmental NGOs help assess the environmental impact and then find methods of mitigating it. Business can work with local governments, development agencies, labour organizations and development NGOs to ensure that its impact on society goes beyond financial value creation to contribute to the better functioning of society as a whole.

Building trust through open reporting

To achieve this, a corporation needs a management system. A good starting point for that system is to ask about any operation or project: who is impacted? We have always considered our customers, but this is not just about our customers, it is about all those who are potentially impacted. Have we consulted them? Have we considered how their input can improve the overall sustainability of the project? Have we made the adjustments, still looking at all three legs? Can we improve? Are there adjustments we can make to our product or activity that will deliver societal benefits or at least support the activities of others? Have we set and publish...d targets? Do we report publicly on our performance against those targets? What is the reaction of those impacted, including our shareholders and customers? Can we improve? And so on round the loop again, consulting, setting targets, reporting performance openly.

This openness is essential, and is supported by reporting against published targets. Openness builds trust and allows all to see what progress is being made. Some standardization of reporting is sensible for two reasons. It allows businesses and the public at large to benchmark performance against others in the same industry; and, if there is a standard reporting format, this protects business from the load of responding to queries in many different formats. That is why the Global Reporting Initiative (GRI) is as important for business as it is for society at large. It hastens the day when there will be standard formats, with some standard elements of reporting and others specifically tailored to industry sectors. The GRI is a reporting system developed by those who have to produce the figures (initially industry, but in future governments and NGOs), working with representatives of civil society, to whom the figures will be of use in making choices. The seminal support of UNEP for this initiative is truly admirable.

Sectoral initiatives for the Johannesburg agenda

There are some excellent examples from all around the world in various business sectors. I would draw your attention to the Marine Stewardship Council's work with major retailers on sustainable fisheries. Or the work done on sustainable forestry by the Forest Stewardship Council, again a collective effort between business and NGOs. Or work done cooperatively in the clothing and footwear manufacturing industry on child labour. Or the excellent collaboration between industry and civil society organizations on mining and minerals and sustainable development. Or the work done in the electricity, cement or fertilizer industries. Or the chemical industry's Responsible Care programme. Again, UNEP has played an important role in tracking progress in each sector through its sectoral reports. Under the auspices of UNEP, 22 industry groups have reported on progress since Rio and outlined the path ahead in a series of reports that have been commented by NGOs, labour and other organizations. All these approaches clearly demonstrate the business commitment to working in partnership with others and building trust through open dialogue and reporting.

You will note that, in all of these, the initiatives are on a sectoral basis. The critical issues are very different for the energy industry, the financial industry, the automotive industry and so on. And the civil society organizations involved, whether NGOs or labour organizations, also tend to focus on particular issues or industries. Thus, in preparing the agenda for Johannesburg, I believe that it is important to have a sectoral element as well as addressing the many cross-cutting issues. If we are looking for real concrete examples and commitments for the future, they will be developed on a sectoral basis. So the idea for a Johannesburg agenda that delivers two different types of output is gaining ground. The first output will be an intergovernmental agreement building on the agreements at Rio and seeking to strengthen the global institutional framework for sustainable development and eradication of poverty. The second output will be a series of initiatives, developed on a thematic or sectoral basis, addressing energy, water, health, agriculture and so on and will be reflected in commitments on an issue or sectoral basis rather than across industry as a whole. But they will also include all those involved or impacted in that sector, e.g. governments, representatives of affected populations, NGOs, labour, scientists. As these initiatives develop, we will report on them on *www.basd-action.net*.

Monitoring progress and performance

Initiatives and commitments are of little value unless results are actually delivered. Mechanisms to report on and track progress are an essential component. These are best kept simple and integral to the process. Where more global monitoring is required, a promising approach is the networking of existing organizations around the world. For example, UNEP has suggested a Global Sustainable Energy Network linking existing regional centres, and through them national institutions that can measure progress against targets set as well as sharing best practice and providing practical policy and technical advice. Such a network has the great advantage that while quality can be maintained through peer review by other network members, monitoring is done on a national or regional basis, avoiding any feeling of finger-pointing from one hemisphere to another.

Ships in the night?

I have one big concern about WSSD. Among the main challenges for the Johannesburg summit will be how to achieve sustainable development in the poorest countries of the world, and in the poorer parts of other developing countries. Through the processes I have mentioned, we will have some exciting examples of progress and the good things that are happening. They are happening in relation to our normal operations, generally in partnership, and there is no doubt that we can do better. But essentially this in areas where there *is* economic development. At Johannesburg there will be concern, and frustration and anger too, about the poorest countries (and the poor parts of many countries) where there is no economic activity. This is a vital issue, because we are talking about two halves of the same planet.

The business community often attributes poverty and lack of development in these countries to a lack of investment and economic development consequent on poor governance, including corruption, often linked with uncertain security, as well as small and inflexible markets. Others seeking more equitable development ascribe such poverty to failures in the process of globalization, whereby untrammelled free markets either do not encourage economic activity in these countries or do so on terms unfavourable to sustainable development. This group will argue that the whole economic system needs changing. They will argue that markets have failed to deliver what is needed, and that the only way forward is to have regulations with real teeth to control the activities of business and drive development in the areas where we so desperately need it. On the other hand, Georg Kell of the UN Global Compact team likes to say that the problem in those areas of no economic development is not business – it is *no business*. Most business people would agree to that. How do we stop these two groups sailing past each other like ships in the night at Johannesburg? Or worse, like battle fleets lobbing shells at each other from afar, or at least well outside normal communication range? In the following sections I suggest some ways of achieving convergence.

Markets or regulation, or regulated markets?

Markets are sometimes seen as being impersonal and serving the interests mainly of large corporations. On the contrary, markets serve the interests of the individual and the consumer. Which of us, when seeking to buy food, does not want the opportunity to choose the type of food, quality and price that suits us? Which small farmers do not want to know that they are able to sell their produce, not to a monopoly purchaser, government or private sector, which gives them a take it or leave it price, but to a market where they can be informed about pricing and have some choice of outlet. In order to achieve this, all markets need a proper regulatory framework to prevent the formation of monopolies, government or private, and ensure availability and accuracy of information, so that choices can be made. A key to establishing sound markets is to remove access barriers such as those preventing access of agricultural goods to any countries or distorting the market through subsidies.

Sustainable development is best achieved through open, competitive, rightly-framed international markets that encourage efficiency and innovation, both of which are necessities for sustainable human progress. I believe that business remains the most potent force for wealth creation, and the extent to which that wealth contributes to poverty eradication depends largely on societal choices. Countries with low incidences of poverty have largely achieved this through creating frameworks that encourage business enterprise, supplemented with supportive welfare programmes.

These enterprises offer people tools – business opportunities, jobs, wages, investment possibilities, training and pensions – with which to build secure lives. Governments that make it hard for business to do business, and that try to take the place of business in meeting people's needs (instead of working with business), stand in the way of prosperity.

It is ironic that business is seen as being anti-regulation. The very stock markets on which capitalism is based need regulatory frameworks. Every stock market in the world has regulation, developed through crisis and bitter experience, to promote standards of transparency and reporting in line with mandatory and audited standards. This is essential if customers are to be able to make sensible choices. Within the framework of markets there are regulations to ensure that privileged groups do not have access to information allowing them to take advantage of others (e.g. that large shareholders do not have an advantage over the individual saver). Of course there are failures from time to time, but most business people readily accept that this kind of regulatory framework is essential for the fair and open operation of markets. If these frameworks are to be effective, there must be credible sanctions against those who deliberately flout them.

Business people are not against regulatory frameworks. What we fear is detailed regulation that attempts to specify in detail the means of delivery. Let me give an example from the field of environmental regulation. Standards of performance in relation to emissions are essential, whether for factories or vehicles. Without such standards a less scrupulous business may gain a competitive advantage over another by delivering a cheaper but less eco-efficient product to customers. Of course, in a more perfect world the consumer would observe the difference and choose the product that was better for society in the long run. Alas we are far from perfect, so regulation to specify minimum emission standards – and perhaps to label in ways to assist consumers in making informed choices – is sensible. But where the regulation specifies not just the standard, but exactly how it is to be achieved, which technology or formulation is to be used, the creativity of the market is killed. For example, we should set emission and efficiency standards but not mandate the technology of the fuel to meet them. Competitive experimentation on how to deliver the same performance in different but more resource-efficient ways is frozen. We lose the great benefit of competition and the market. The fun and creativity go out of the business, and we simply fill our time ensuring that our products meet ever more complex regulations.

Voluntary initiatives or international regulation?

If business agrees that a sensible regulatory framework is necessary for the effective functioning of markets, why do we not all push for some kind of international legislation that controls the activities of at least those corporations which operate across international boundaries? Would this not rapidly raise labour and environmental standards around the globe?

It is undoubtedly true that international companies do not pay their employees the same rates in every country. But studies show that those working for foreign investors earn 1.4 times as much on average as those employed by domestic firms in high income countries and twice as much in low income countries. The issue is not normally the wages and conditions of foreign enterprises, but those in domestic business. Corporations with major global brands are subject to the scrutiny of global markets and consumers. There is no doubt that, whatever our own motivation, this is a factor in encouraging improved performance and ensuring that a company operates to the same standards in all its markets. Companies rooted in one country derive their norms largely from that country. The battle to improve standards has to be fought country by country and lift the performance of each country. Not surprisingly, individual sovereign countries have views on priorities, levels of standards and rates of change within their own jurisdiction. Uniform minimum standards effectively enforced around the world would favour large transnational corporations over smaller companies from developing countries. I do not, however, believe that this would be politically achievable even if it were desirable. The preservation of national sovereignty and the fear of protectionism will prevent national governments from accepting universal regulation. That does not mean we should not continue to strive to make as rapid progress as possible in areas where international agreement is most needed – on global environmental issues such as climate, an equitable framework for trade, sensible revisions to global monetary systems, agreements to preserve global biodiversity and so on, as well as truly bringing into force everywhere the basic agreements on human rights, labour and the environment that were adopted at Rio and form the basis of the Global Compact.

I believe strongly that high environmental and labour standards are in no way a barrier to outstanding economic performance. On the contrary, the same sound management of assets and people that delivers good environmental and workplace performance delivers good business performance. I have personally observed this virtuous combination in countless companies and operations around the world.

Far from being a soft option, so-called "voluntary initiatives" from international companies can lead the way in making improvements around the world. As they are seen to be effectively applied in developing countries, and as the same standards are progressively applied to suppliers (with support and capacity building to ensure that local suppliers can meet the required standards over time), standards in business in these countries are progressively raised. Furthermore, if these standards have been developed with stakeholders and publicly committed to, they effectively cease to be "voluntary". Global information systems, global media, global NGOs and increasingly discerning consumers ensure that failure to live up to public commitments, even self-imposed ones, are punished in the marketplace.

Sound governance all round

We have been talking about standards and regulation as applied to companies. But of course one of the reasons business activity and investment do not flow to certain countries is the absence of an adequate overall governance framework – property rights, the rule of law, security, transparency, development of strong institutions of civil society – in which business can operate effectively. Business has a responsibility to work with others to strengthen this governance structure. Individual businesses can contribute, but local business organizations can be very effective agents in this process, often in partnership with other actors in civil society. Business has to be an integral and contributing part of any effective governance framework, operating to high standards and with transparency. This includes a commitment to support the adoption of OECD guidelines on corruption. Sound governance is something we have to join hands to develop together.

An encouraging example is the New Partnership for African Development (NEPAD). African leaders, including the presidents of Algeria, Nigeria and South Africa, have joined together to plan how Africa's governance and infrastructure framework can be developed. One of their aims is to create an environment that will be attractive to business and development. But business itself must contribute to the development of that environment. I know this is very much in line with the vision of the African leaders. A key element is the proposal for a peer review of each country's performance against the objectives of the plan. I have heard leaders commit themselves to this mutual but constructive evaluation. Business needs to join in such a process. I hope there will be open and constructive evaluation of our performance, against our objectives and commitments, by all partners. The objective has to be to work together to achieve sound governance all round.

So what will business bring to Johannesburg?

We will be in Johannesburg in a spirit of partnership, demonstrating the progress in sustainable development that has been and can be made through working together with others. With others we will have a series of initiatives, leading to the establishment of targets and appropriate mechanisms for tracking delivery and performance.

We will need to build trust through a commitment to open reporting. A commitment to markets as a mechanism for providing choice and efficiently allocating resources is essential, but we should make plain our support for sound and stable regulatory frameworks within which markets can operate. Business will play its part in the task of establishing sound governance all round, supporting the rule of law, strong institutions of civil society, security, property rights and transparency. Sound governance is essential if the activities of businesses large and small are to grow in areas

currently blighted by the lack of the economic activity essential to sustainable development.

The process by which international business raises the bar voluntarily is a valuable contribution to raising standards. Even though such commitments may be voluntary in origin, the performance of business in relation to those commitments, which have often been made in consultation with many others, is transparent to all – not just through their own (often verified) reporting, but through the observations of partner organizations, civil society and consumer groups as well as the media. Where possible, however, business does support the development of international frameworks with respect to global environmental issues and trade, as well as truly bringing into force everywhere basic agreements on human rights, labour and the environment such those reflected in the Global Compact. Of equal importance is to ensure the building of sound governance for all (including business) within sovereign nations, without which global agreements cannot be globally effective.

By working together in this way, we can ensure that business makes its essential contribution to sustainable development.

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Making development good business

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Summary

The concept of corporate social responsibility is progressing beyond relatively simplistic notions of philanthropy and legal compliance to include the broader ethical underpinnings of doing business and behaving as good corporate citizens. The next phase of this evolution may be driven by expansion of profitable business activities into markets that were largely neglected in the past. Delivering goods and services needed to satisfy the basic requirements of the poor – while simultaneously creating purchasing power in their local economies – can be both profitable and socially responsible.

Résumé

Le concept de responsabilité sociale des entreprises commence à progresser au-delà des notions relativement simplistes de philanthropie et de respect de la législation pour recouvrir des fondements éthiques plus larges, à savoir faire des affaires et se comporter comme de bons citoyens de l'entreprise. La prochaine étape de cette évolution pourrait être induite par l'arrivée d'activités commerciales rentables sur des marchés auparavant négligés pour la plupart. Fournir les biens et services nécessaires pour répondre aux besoins élémentaires des plus pauvres tout en créant un pouvoir d'achat dans les économies locales peut être une démarche à la fois rentable et socialement responsable.

Resumen

El concepto de responsabilidad social corporativa que se está desarrollando va más allá de las nociones relativamente simplistas de filantropía y observancia jurídica, basándose en una ética más amplia que contempla hacer buenos negocios y comportarse como ciudadanos corporativos responsables. La siguiente fase de esta evolución puede verse impulsada por la expansión de negocios lucrativos en mercados fuertemente rechazados en el pasado. La transmisión de bienes y servicios requeridos para satisfacer las necesidades básicas de los pobres – al mismo tiempo que genera poder de compra en sus economías locales – puede resultar tanto económicamente beneficioso como socialmente responsable.

To achieve a sustainable future, countries in the developing world clearly have two priorities that must come before all others. The first is to ensure that all their citizens have access to the means of satisfying their basic needs. The second is to evolve practices that bring their environmental resource base back to its full health and former productivity. To achieve these primary goals requires action on two fronts. We must:

- create sustainable *livelihoods* on a very large scale, particularly for the poor and marginalized; and
- encourage sustainable *lifestyles* among all our people, particularly the rich and privileged.

Creating jobs and livelihoods should generally be the job of the private sector. However, this has not been the case in most of the Third World. Countries that achieved independence during the past 50 years have yet to break out of the patterns of employment they acquired over centuries of feudal or colonial rule. Until they do so, there is little hope that they will be able to create active markets and thus evolve into sustainable economies.

Take the case of India. Apart from its size, it is typical in its inability to break into the kind of production systems now needed to take an active part in the global economy. Today India has over 20 million people working for government and public agencies, while only some 10 million are employed in "organized" or "formal" industries. These 30 million jobs are those to which the greatest part of governmental decision-making and attention are devoted. Yet these figures are dwarfed by the number of workers employed in the SME and "informal" sectors in urban areas – roughly 110 million – and in agriculture, which employs about 240 million. Some 250 to 300 million people (i.e. the rest of the labour force) are basically out of work. The proportions are not very different in other poor countries except, perhaps, the size of the public sector, which for historical reasons is rather bloated in India.

Large corporate houses and other businesses in the organized private sector are not currently geared to create jobs or livelihoods in the numbers needed. If they have created jobs, they have largely been driven by tax incentives or other regulato-

ry requirements. Some corporations also have philanthropic programmes, in which they devote some of their profits to socially desirable activities ("doing good by doing well"). Fundamentally, however, as has been demonstrated repeatedly by the work of independent agencies such as Development Alternatives, the technology, financial and marketing imperatives of the larger businesses operating in a globalizing economy make it unlikely that they will wish to create jobs until the forces of competition change substantially. This will happen only when businesses recognize the limits of today's market systems and the opportunities offered by alternative ones. Until then, competition ensures that investments will continue to be made in capital rather than in labour.

In the meantime, despite political temptations to the contrary, governments at all levels have begun to show tendencies to cut back gradually on payrolls. The result is that overall employment in the formal sectors of Third World economies is stagnating and sometimes even falling, while the number of job market entrants is rising rapidly. Actors other than big business and the public sector will have to take responsibility for creating sustainable jobs and livelihoods and show the way to bringing everyone into the productive work force. The only economic entity capable of doing this on the scale required is the private sector in its larger meaning: starting with the "informal sector", followed by small business entities, and subsequently perhaps by ever larger businesses over a period of time.

Social enterprises

Such a transformation in the private sector's mode of operation will not be easy to bring about. Encouraging widespread adoption of sustainable lifestyles requires the concerted efforts of all our leaders – decision or opinion makers in government, business, media, schools and universities, voluntary organizations and (not least) institutions of religion and faith. Since neither those who run government (whatever their political party or administrative cadre) nor those in business in developing countries have shown much inclination to provide such leadership, it must come from other sectors of society, for example "civil society".

Civil society comprises all those institutions working towards social objectives outside the public and for-profit sectors. It includes a wide variety of NGOs, voluntary agencies, community based organizations and special interest groups that deal with issues ranging from gender or animal rights to religion and empowerment. Although so far civil society has not fared much better than either government or business in delivering the needed results, it offers some hope and could serve as an effective entry point on the road to building a better and more equitable future.

In many parts of the world civil society is beginning to provide stronger leadership and could, in principle, become influential enough to have a positive impact even on the public and private sectors. It will, in fact, have to go beyond itself and form partnerships and strategic alliances with these sectors to define and implement action that responds ... the higher-level interests of all these actors. To accelerate the process of making development more sustainable will probably require new kinds of institutions – a kind of marriage between the small private sector and civil society. We like to call entities of this type "*sustainable enterprises*" – organizations that have social objectives and business-like strategies. Others call them, perhaps more descriptively, "social enterprises".

Although there are not yet many successful social enterprises in the Third World, some remarkable examples do exist. BRAC, the Grameen Bank and Proshica in Bangladesh, and PDA in Thailand, have shown the extraordinary power of bringing business-like approaches to financing and marketing into the development arena. The Development Alternatives/TARA group in India has similarly explored the range of possibilities in the field of technology innovation and natural resource management.

Both the primary societal objectives listed above (sustainable livelihoods and sustainable lifestyles) are best met by the same sustainable enterprises – small, local, environmentally benign businesses that create jobs and generate products and services in the community. Such enterprises are usually technology based, employ a small number of workers and can be highly profitable, as each of the organizations just mentioned has shown. In size they lie roughly between the realm of what are often termed "small or medium enterprises" at the top end, and "micro enterprises" at the bottom.

Failure of the market

To design an effective strategy based on such enterprises, it is necessary to recognize that the rural market (which broadly coincides with the markets currently underserved by businesses) has its own logic. It cannot be judged by standards or frames of reference derived from the performance of other markets. In their terms it is a somewhat inexplicable paradox: a vast sea of needs that are not being converted into demand, and a huge potential production capacity not resulting in supply.

Some figures highlight the magnitude and complexity of this paradox:

- Over 20% of the world's people (1.3 billion – living mostly in the South) survive on an income of less than $1 per day;
- Half the world's population lives on an income of less than $2 per day;
- Some 65% of people in Africa and Asia live in villages (the figure for India is 74%);
- Some of the most active markets for motorcycles and TVs are in rural areas (the figures for India are 55% and 40%, respectively);
- Because of its size, the rural market is a significant contributor to GNP (e.g. 58% for India)

The last two items demonstrate that the rural market's current state of stagnation, where the overall level of transactions continues to be low, cannot be explained simply by lack of purchasing power or unavailability of money in this market.

The main reason for this massive failure of the market appears to lie in the fact that urban markets have provided enough easy pickings for most businesses to make satisfactory profits without having to deal with the difficulties of setting up marketing channels in rural areas. There are other barriers to opening up this market as well: poor infrastructure, including lower (though not necessarily negligible) returns on investment; high variability, according to the season in which transactions take place; and difficulties in providing after-sales support.

To succeed in this marketplace, a sustainable enterprise requires many types of support systems. It needs to carry out market research and develop a business plan. It needs to choose, acquire and master complex technologies. Once it goes into operation, it needs technical support to keep these technologies in good shape. It needs financing for fixed and working capital. It needs help creating markets for its products. In other words, it needs what any big business needs. Such full spectrum support systems for sustainable enterprises are largely missing in the Indian economy.

Thus, one of the key elements in any effective strategy to deploy and nurture sustainable enterprises is the establishment of support (or "mother") organizations that can provide the integrated services needed to make the sustainable enterprise profitable, directly or through aggregation of available inputs from others. To help its partner enterprises succeed in the marketplace, such a support organization must be able to provide highly sophisticated services involving complex technologies and support systems. It also needs the highest levels of innovation and implementation, which in turn involves the very best in creativity and management expertise. All these elements are expensive and raise the cost of doing business, since sooner or later the costs will have to be passed on to the enterprises and eventually to the end customers.

Mismatch of costs and revenues

Herein lies a fundamental contradiction: the end customers served by such an enterprise have very limited assets or purchasing power.

After all, the very best in creativity and management expertise comes at a price – a price determined today by the interplay of economic forces in the so-called global economy. Mechanical engineers, software designers and MBAs nowadays commonly *start* their careers at salaries approaching $30,000 a year, even in an economy like India's, and are paid twice that on overseas assignments. The cost of office space, computers, equipment, travel and other operational expenses is comparable to that in industrialized countries and often higher. These are the kinds of costs faced by any meaningful initiative to create sustainable livelihoods and implement programmes to bring them to rural areas of a developing country in large numbers.

It is not only that the cost of creating products needed in the countryside is high. The cost of delivering them is even more exorbitant because of inadequate infrastructure: few roads, little power and no connectivity. Rural customers face a market in which already expensive products are

made even more expensive due to lack of infrastructure – most of which has been made available at public expense to their urban counterparts at virtually no charge.

TARAhaat, a rurally oriented Internet portal in India that plans to provide shared local connectivity and access for villagers through franchised cyber cafes located in villages all over the country, is a good example of a social enterprise that has its cost leg in the global economy and its revenue leg firmly planted in the local village economy. In catering to the needs of the rural public (which constitutes three-quarters of India's population) TARAhaat often has to include the costs of generating power and establishing connectivity in the business plan – infrastructure that is available at little or no cost in the city.

In the industrialized economy the prices commanded by the outputs of activities based on such costs can easily be paid by customers, who also earn comparable incomes. That is the basis of the closed loop of household incomes and corporate expenditures explained in Chapter One of every economics textbook. And most of the infrastructure cost has already been paid.

But in a rural economy like that of India the customer earns less than $2 a day. Clearly there exists a massive disjoint between the cost of the goods and services needed by the poor and the prices they can pay for them.

The old approaches to reducing disparity in an economy through give-away schemes are no longer credible either to political leaders, who are now expected by their financiers to balance their budgets much more aggressively, or to development economists, who have realized that any such redistribution of wealth is tenuous at best. Although many of the massive boondoggle and pork barrel "poverty alleviation" programmes administered by governments in a number of countries still have to be dismantled, the future is widely perceived to lie elsewhere.

A solution often suggested, not just by the private sector but also by many in public agencies, is that the rural market is best left alone until it has generated the purchasing power and been "given" the requisite infrastructure to attract purely commercial ventures to provide the products and services it needs. A variant of this is "let them move to the city". But of course these are not solutions: they are simply an admission of defeat. They are no better than consigning the rural poor to an oblivion of endless cycles of poverty-hopelessness-high fertility-poverty, whether in village or city slum, out of which they can never emerge.

Matching prices to purchasing power

One possible solution lies in bringing the costs of delivering a product or service down to the lowest possible level. The second lies in passing on to the consumer only its incremental costs. The third, of course, lies in increasing the purchasing power of the customer. In all three cases the economics of the support or "mother" organization becomes extremely important.

The first solution is itself achieved through a combination of well known business strategies: creating standardized products, franchising local production and delivery systems, and building up high sales volumes. Within the constraints of the village economy, building up sales volumes can only be achieved by discarding conventional theories about focusing on a single product line. It is the "country store" or supermarket that supplies an adequately broad range of goods to bring in enough customers who spend (possibly small) amounts on a sufficiently large number of items, which can cover its cost of operations and so survive commercially. In this case it is the "economies of variety" that substitute for the economies of scale that do not exist in a small and limited market. Such volumes take time to build up to, and the business must have staying power.

The second solution implies that any major investments, particularly for infrastructure such as roads, telephones, water and energy, are paid for by public or other sources of funds and only the incremental cost is passed on to the consumer. This is not an unusual approach: the rich and city people get such services all the time: they do not have to pay directly for the capital costs, which are amortized into the cost of the service provided.

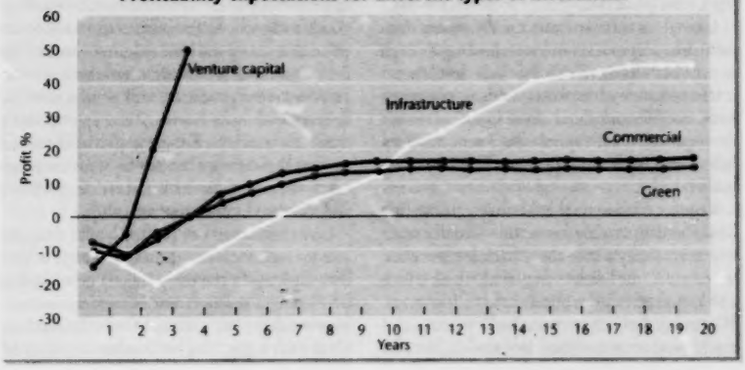
The third approach is embedded integrally in the concept underlying sustainable livelihoods: local enterprises create the jobs and hence the income needed to purchase the products they generate (the kind of economic bootstrapping cycle Henry Ford dreamt of, applied to the village).

For local solutions to work, they need higher level support services: brand equity, technology and know-how, training, maintenance and marketing. These services cost money. So do all the front-end investments in research, infrastructure, start-up and operationalization of a business. Many of these business supports are available at little or no cost to urban industries. It is therefore justifiable to provide them for organizations that support rural industries, too. Consequently the customer faces only the downstream recurring costs of production and distribution – probably the only type of subsidy that can be justified on any grounds.

Each of these solutions needs public resources for capital investments, so that the incremental costs of each unit of product or service can be brought down to a level that is affordable to the buying public. This means we must learn to adopt different time horizons, financing instruments and profitability expectations from those of today. Even in the United States, where consumers have far greater purchasing power, rural infrastructure such as electrification was achieved with financing at 1-3%, repayment moratoria of several years and break-even expectations of 20 to 40 years.

Private sector inputs are also needed: operational financing, management efficiency, and the ability to deliver results. In the longer run, realistic business analysis shows that even the dispersed rural market can provide commercially viable opportunities for many types of products and services.

Figure 1
Profitability expectations for different types of investment



Integrating the public and the private

This is why Development Alternatives and its affiliates such as TARA and TARAhaat have found it necessary to mix the public and the private, which is pure anathema in conventional institutional design. The breakthrough lies in clearly separating objectives from strategies. In addition to commercial viability, the objectives of such an enterprise are primarily social, environmental and developmental. The strategies and methods used to achieve them, on the other hand, are purely business. We need sources of capital that can accept longer time horizons for achieving profitability and possibly lower profits than are sometimes available in the market.

Figure 1 shows, in a broad and schematic way, how expectations regarding financial returns over a period of time vary for different types of investors. Each curve describes roughly what each investor constituency considers to be acceptable minimum returns on investment. The perceptions reflected in the curves were obtained from interviews with members of each broad constituency. Conventional venture capitalists are primarily interested in very high and very quick returns. Their normal mode of operation is to put equity and loans at the disposal of entrepreneurs with a business plan that promises almost immediate return. As soon as the market value of the business reaches a few multiples of the original investment, venture capitalists sell their shares at a

significant profit. High-return industries such as high technology or high-value resource processing are the primary targets for such investments.

Capital for infrastructure usually comes from cash-rich, deep-pocket investors looking for high returns but willing to wait for them. Initially, for infrastructure such as roads, bridges, telephone lines, satellites and dams, major inputs of money are required. Once capital investment has been fully depreciated, the returns are largely straight profits.

Regular commercial investors – including banks and financing agencies – usually want return on equity a little above bank interest rates, starting after the break-even period, which is usually expected to be around three to five years. "Green" or "socially responsible" investors also expect good returns on their investments, but they are prepared to accept somewhat longer time horizons and lower dividends.

Conclusions

The rural communities of the Third World are a huge untapped market for industrially produced goods and services. For businesses to succeed in this market, they will have to learn from their earlier success in more affluent markets: it is necessary to create products, and production and delivery systems to market them, appropriate to these new markets. Simple copies of those that worked elsewhere are unlikely to be good enough. They will need to be smaller, more decentralized, and based on local entrepreneurship.

Large businesses can profitably play a support role for such local enterprises, though it is likely that (at least in the early stages) new kinds of development ventures may be needed that combine social objectives with business-like methods. Until such supporting or "mother" ventures can demonstrate profitability, financing is clearly more likely to come from public agencies, development banks and green investors than from venture capitalists. Indeed there is considerable justification for initial funding in the form of grants and donations, since the earning capacity in the first establishment phase can only be very small. Given the potential size and voracious appetite of this market, however, venture capitalists with a little more imagination and a longer view than usual would find in it excellent opportunities for investment.

There appear to be many such areas where corporate social responsibility converges with corporate self-interest, offering challenging but highly worthwhile opportunities for doing well by doing good.

Until such a realization becomes widespread among the private sector, the onus will be on the independent sector, the business-like end of civil society, to carry forward the war against poverty and environmental destruction. ◆

Sustainability for all

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Summary

Sustainability will not be achieved unless it becomes the central axis of ecomic policy. If the "rich countries" do not undertake to transform their consumption patterns, no one will take sustainable development seriously. Building on Greenpeace International's proposal to begin the "renewable energy revolution" at Johannesburg, this article illustrates the need to ensure corporate accountability and liability for environmental damage. Johannesburg would be a step in the wrong direction if its outcomes were restricted to partnership initiatives alone, with no effective renewed commitments by governments and time-bound targets.

Résumé

La soutenabilité ne sera pas atteinte à moins qu'elle ne devienne l'axe central de la politique économique. Personne ne prendra le développement durable au sérieux tant que les « pays riches » n'auront pas modifié leurs propres modes de consommation. Partant de la proposition de Greenpeace International de donner le coup d'envoi à « la révolution des énergies renouvelables » à Johannesbourg, l'article fournit des exemples illustrant la nécessité de renforcer la responsabilité des entreprises pour les dommages à l'environnement. Johannesbourg serait un pas en arrière si le contenu du sommet se limitait à des initiatives de partenariat sans engagements renouvelés et réels des gouvernements, avec des objectifs et des calendriers.

Resumen

La sostenibilidad no se alcanzará a menos que esta se convierta en el eje central de las políticas económicas. Nadie tomará el desarrollo sostenible en serio mientras los "países ricos" no hayan transformado sus propias pautas de consumo. Partiendo de la proposición de Greenpeace International de iniciar la "revolución de las energías renovables" en Johanesburgo, el artículo recoge ejemplos sobre la necesidad de reforzar la responsabilidad por daño ambiental de las empresas. Johanesburgo representará un paso atrás si los alcances de la cumbre se limitan a iniciativas privadas sin compromisos gubernamentales renovados, con objetivos y calendarios.

One of the underlying reasons the business sector and the vast majority of governments in the "rich countries" have not taken sustainable development seriously enough may – sadly – be because of the word *development*. The Rio Earth Summit was rightly about environment and development. However, the "rich North" has not taken seriously the concept of *common but differentiated responsibility* enshrined in the Rio agreements. It has entertained, often deliberately, the false notion that sustainaibility is a goal for the developing world, not for the "developed" one.

Ever since Rio, each time we hear a representative from a rich industrialized country refer to his country as "developed" our reaction is: "Another one who has not understood what Rio was about!" Greenpeace had hoped Rio would be the beginning of a real paradigm shift, whereby no country could claim it was "developed" if it had not achieved the goals set in the Rio agreements (including Agenda 21). Since everyone had agreed that sustainable development was the goal, everyone needed to develop towards this goal.

In other words, since Rio all countries should consider themselves to be economies in transition. As their consumption and production patterns are the least sustainable, members of the OECD

(commonly known as the developed countries) are, in the Rio sense, the least developed – if we are to take the Rio sustainability goal seriously.

Of course, lack of action by those countries with the greatest wealth and capacity does not enhance confidence-building globally. In these circumstances it is easy to understand why developing countries feel increasingly that they were cheated at Rio. This, for example, is why they are suspicious of the idea of incorporating the precautionary principle in the decision-making of the World Trade Organization (WTO) despite the fact that developing countries played an important role in incorporating the precautionary principle in a number of Multilateral Environmental Agreements.[1]

Many commentators have said that, as long as the rich few do not contribute their share according to the Rio bargain, the developing countries will not take their environmental responsibility seriously. To a large extent this is true. But much needed technical and financial assistance to developing countries is only a part of the rich few's share. It must also include a serious shift in consumption and production patterns in the North, which are increasing the pressure on biodiversity and the environment (including the world climate system) worldwide.

I must recognize that George Bush is right when he says that effective action against climate change would affect the *American lifestyle*. But he is wrong to use this as an excuse for inaction. He does not see that the American lifestyle is part of the problem. He is wrong, and irresponsible as well, because (although many Americans may wrongly think that with technological fixes they will contain most of the effects of climate change on themselves) he does not take account of the boomerang effect on everyone (including the United States) arising from the absence of environmental and social equity and security worldwide.

Clean energy for all

Up until the Fourth Session of the Preparatory Committee for the World Summit on Sustainable Development (WSSD), most countries have opposed the inclusion of a target with a timetable for significantly increasing the share of renewable energy.[2]

In 2001 a Renewable Energy Task Force chaired by Sir Mark Moody-Stuart, established by the G8 at their Okinawa Summit in 2000 "to identify the barriers and solutions to elevating the level of renewable energy supply and distribution in developing countries", issued detailed and significant recommendations drawn from the best expertise from around the world. If agreed and implemented, these recommendations would go a long way towards generating the global renewable energy revolution needed to combat climate change and improve the lives of billions of people worldwide. The report calls for the G8 governments to set a target of bringing renewable energy to 1 billion people within a decade. (The G8 leaders decided to remove consideration of this report from the agenda before their meeting at Genoa in July 2001.)

Six months later, the Consultation on Energy of the Global Environment Facility (GEF) reached similar conclusions. It recommended that the Preparatory Committee for the WSSD take real action to promote renewables. Yet only a tiny minority of countries seem to be listening.

During the WSSD preparatory process Venezuela, when speaking on behalf of the Group of 77 Plus China,[3] has sounded so far more like a representative of OPEC (of which it is of course a member). It has helped President Bush in his efforts to kill the Johannesburg Summit. The European Union is not showing the right signs of leadership either.

The energy choices the world makes today will determine our collective development path for many decades to come. Shall we continue to go down the "conventional" energy development path, using fossil fuel and nuclear energy and other 19th and 20th century technologies, despite the fact they are ultimately unsustainable and have not delivered even the most basic energy services to 2 billion of the world's poorest? Or shall we choose now to pursue a truly sustainable development path, both North and South, based on efficient use of sustainable, clean, renewable energy?

Energy is central to all human activity. Access to basic, clean energy services is an essential prerequisite for development and poverty alleviation. It provides major benefits in the areas of health, literacy and equity. When measured against the three pillars of sustainable development – environmental, social and economic – the choice is clear. The threat of climate change, human health impacts, and the desire for equitable economic development all argue in favour of a sustainable, renewable energy path.[4]

It would be incomprehensible if sustainable and renewable energy as a cross-cutting issue were not on the WSSD agenda, and if governments did not commit to a global programme to encourage and launch a massive uptake of renewable energy, which is necessary to meet both development and climate protection goals.

If governments at the WSSD are serious about sustainability and equity, they should adopt a three-fold strategy to:

- commit to ensuring access to sustainable, renewable sources of energy, within ten years, to the 2 billion of the world's poorest people who do not currently have access to basic modern energy services;
- commit and agree to an action plan to rapidly accelerate development of renewable energy markets globally, to bring down technology costs and as the primary means of meeting the emissions targets necessary to combat climate change; and
- commit to phase out, within ten years, subsidies of conventional energy sources, estimated at US$250-300 billion annually, with a transition plan and flexible time frames to avoid undue hardships on developing countries that are overly reliant on conventional energy sources and exports.

Corporate accountability

The role of the coal and oil industry in undermining the Kyoto Protocol has been well documented. Everyone knows the Bush administration's policy on climate has been dictated by the US fossil fuel energy sector, including Enron.

A leaked 2001 memo from Exxon-Mobile to the White House also demonstrates that this company demanded that the Bush administration undertake a campaign to remove the Chief Scientist of the World Bank, Dr. Robert Watson, from his position as Chairman of the Intergovernmental Panel on Climate Change (IPCC). After trying unsuccessfully to beat the science,[5] Exxon and President Bush decided as their last resort to beat the scientists (while continuing to pretend that it is the environmentalists who are emotional and do not respect scientific facts!).

At the 19th Session of the IPCC in April 2002, the Exxon-led anti-green witch hunt payed off. The US delegation (with active support from OPEC member states and Japan) managed to impose "their" candidate, Dr. R.K. Pachauri of India, to replace Dr. Watson. In response, Greenpeace has called on Dr. Pachauri to "rise above the forces that put him in place", and to live up to his own words and continue to challenge "those who stand in the way of continuing good science and action to prevent climate change." Indeed, environmentalists are urging responsible governments to make sure the kind of environmental McCarthyism driving US politics does not entirely demolish the still very small legacy of the first decade of the UN Framework Convention on Climate Change (UNFCCC).

The role of corporations like Enron and Exxon in policy-making raises important questions about corporate environmental accountability, which should be addressed and resolved by the Johannesburg Summit. Environmental organizations have urged the Preparatory Committee for the WSSD to address corporate accountability, but the response has been weak to say the least.

Corporate accountability should not only be a cross-cutting issue for the WSSD, but should also be an important part of the interlinked WSSD objective of improving and achieving good governance, including governance in the private sector.

Corporations that voluntarily enter global markets for the benefits and rights afforded them must also be held accountable for accepting the corresponding obligations. The existing one-way street of benefits without obligations must be transformed into a two-way street, based on corporate accountability. In the absence of good governance with respect to corporate accountability, sustainable development will not be achieved.

Among other issues, corporate accountability needs to address liability and compensation for all damage arising from corporate activities, release of all information affecting the environment, social development and human health, and full respect for human rights (of both the community and labour). Creation of a legally binding international corporate accountability instrument is the best way to address the largely justified criticisms, and abuses, of globalization.

In continuing to oppose such an international instrument, the business sector is not doing itself a favour. Rather, it is further increasing and deep-

ening mistrust by the public. The divide between the public and multinational corporations needs to be reduced in a spirit of partnership towards sustainable development. Yet, with far too few exceptions, the corporate world continues the course of status quo and profit (at any and all costs) when it continues to oppose much needed developments such as the growing demand for corporate accountability.

The industries and corporations that will succeed are those which are serious about their responsibilities to the public, to the sustainable development agenda, and to their shareholders – in terms of profit, yes, but good profit based on sustainable activities resulting in solid "good will" or positive name recognition for the company. Indeed, even from a purely economic perspective it is a mistake to hang on to the status quo as the world enters a new era of increasing pressure for sustainability.

It is merely common sense and good economic management to recognize that those who are the fastest and best at securing sustainable market share will prevail in the future. Industry needs to think beyond the next financial quarter to where it wants to be in 20 years with respect to sustainability. Those who do not adapt to sustainable practices will be dinosaurs.

Consequently, the business sector needs to draw up its own action programmes for sustainability. This can be done on a company, industrial sector or association basis. An educational action programme for managers, employees and shareholders, and a substantive action programme for changing to sustainable practices, are also needed.

As the primary party for implementing the required changes, industry should launch its new era of responsibility with time-bound, action-oriented implementation programmes regardless of what governments do or fail to do at Johannesburg. Elements should include:

- *Vision: what will the business sector look like when sustainability is achieved?* For example, within the energy sector the vision should be to meet all energy needs with renewable, environmentally sound energy sources in X number of years. Or, as another example, within each industrial sector the vision should be to establish the goal of zero hazardous substances in wastes and products through avoidance and substitution.
- *Rejection of inherently unsustainable materials and activities.* The business sector needs to recognize that certain activities and materials are inherently unsustainable and should be phased out, while most other activities require modification. Polyvinyl chloride (PVC) plastic, chlorinated solvents, chlorinated bleaching and other chlorine-use industries (as well as the chlor-alkali industry itself) need to abandon chlorine-based processes and reinvest in alternative sodium hydroxide production and alternatives to PVC if we are to eliminate one of the most damaging sources of chemical pollution and adequately implement the goal of eliminating dioxin pollution enshrined in the 2001 POPs Convention.
- *The principle of substitution.* What Greenpeace calls the "clean production industrial revolution" is accelerating. Those who are not part of it will be left behind. The principle of substitution, which requires the substitution of sustainable solutions for unsustainable products, materials and activities, needs to be at the core of this responsible and admirable endeavour.
- *The precautionary principle.* The precautionary principle should be embraced by the business sector. Those opposing it risk being compared to the "tobacco scientists" for their continued attempts to abuse science and undermine it.

The road to Johannesburg

As the work of the Preparatory Committee for the WSSD unfolds, a number of stakeholders and countries seem to be placing high hopes on so-called *Type II* outcomes, e.g. partnership initiatives involving the business and other sectors.

Greenpeace is not opposed to partnership initiatives *per se* (we have triggered and/or participated in a number of them throughout our history), as long as they reinforce and do not replace or undermine adoption of what is known in the new UN jargon as *Type I* outcomes, e.g. the renewed government political commitment and time-bound targets for which the UN General Assembly decided in December 2000 to convene the WSSD in the first place.[6]

What is new and worrying about the Johannesburg Type 1/Type 2 terminology is the unprecedented emphasis being given private sector partnership in the Johannesburg negotiations. In fact, it appears that governments are on the verge of abdicating their own responsibilities.

Immediately after the 3rd Session of the Preparatory Committee, for several days the main headline on the WSSD website was: "Enthusiasm and Some Concerns Voiced over Partnership Proposals". However, "Concern and Some Enthusiasm Voiced over Partnership Proposals" might have been a more accurate reflection of what happened and was said in New York.

Only a few weeks before the Johannesburg Summit, there are too many unanswered questions regarding Type 2 outcomes. For example, who will select them? According to which criteria? How would their implementation be monitored and supervised, and by whom? Isn't there a risk the WSSD will become little more than a global trade fair?

If the United Nations is to become a broker for partnership initiatives, what should the rules of the game be? And most important of all, how do we know they will deliver the kind of progress so urgently needed in virtually every sector?

Our main reason for concern is that despite the warnings of Greenpeace and other NGOs, Type 2 outcomes are in fact being promoted by many within governments, and of course within the private sector, to avoid Type 1 outcomes.

The US delegation said very clearly at the 3rd Session of the Preparatory Committee that it was opposed to any new political commitment being made in Johannesburg. It is clear that, for the US, Type 2 is a means of avoiding the commitments inherent in Type 1 agreements, thereby disregarding the UN General Assembly's mandate for the Earth Summit.

In keeping with this approach, during the 3rd Session the US also opposed inclusion of any reference to the Kyoto Protocol on climate change, in clear contradiction to President Bush's commitment in Gothenburg last year (which he reiterated this year in February) that while the US would not ratify, it would not stand in the way of other countries wishing to do so.

During one of the meetings that took place at the 3rd Session to exchange views on Type 2 outcomes, the US delegation announced its intention to further propose "a partnership initiative on food security". When asked if the proposal would be coupled with a commitment to ratify instruments important to food security, such as the Convention on Biological Diversity (which the US has still not ratified) and the Cartagena Protocol on Biosafety, or with support for a review of the WTO Agreement on Trade-Related Intellectual Property Rights (TRIPs), which affects food security so negatively, the US delegation made no response. How can anyone then believe the US is acting in good faith?

In speaking with environment ministers and their officials in the months preceding the WSSD, we have found that many are putting too much emphasis on private sector partnerships. Like all politicians, they like catch phrases and easy sound bites, and we hear them speaking too much as if Type 2 is "in" and Type 1 is "out". This is nonsense. Type 2 without Type 1 (the US model) would be a dramatic regression ten years after the Rio Earth Summit and 30 years after the Stockholm Conference on the Human Environment. If their predecessors at Rio or Stockholm had taken this approach, the development of international environmental law would not be where it is now and the world would be an even less safe place.

During the 3rd Session of the Preparatory Committee, Greenpeace (together with 12 other NGOs) requested that delegations stick to the UNGA mandate for the WSSD and give priority to political commitments and obligations with the following elements:

- targets and timeframes;
- means of implementation and financial resources;
- institutional requirements; and
- monitoring and reporting.[7]

A non-paper circulated by the South African delegation on 3 April advocated similar views. In addition (and significantly), the WSSD Secretariat took account of some of the concerns expressed at the 3rd Session of the Preparatory Committee and amended their Draft Guidance for Partnerships/Initiatives pursuant to the discussion that took place during the 3rd Session. Accordingly, the Secretariat clarified that:

Type 2 partnership/initiatives are complementary to the globally agreed Type 1 outcomes: they are not intended to substitute commitments by governments in the Type 1 documents, rather they should contribute to translating those political commitments into action. Given the broad range of issues currently being negotiated, it should not prove difficult to link a Type 2 initiative to the negotiated outcome.[8]

A chance to catch up?

In a speech delivered by his wife at the American Museum of Natural History on 14 May of this year, UN Secretary-General Kofi Annan said he sensed "a need for greater clarity on what Johannesburg is about and what it can achieve". He also said that "New efforts are needed because the present model of development, which has brought privilege and prosperity to about 20% of humanity, has also exacted a heavy price by degrading the planet and depleting resources." Furthermore, "at discussions on global finance and the economy, the environment is still treated as an unwelcome guest."

Kofi Annan describes Johannesburg as "a chance to catch up". Referring to "a new ethic of global stewardship," he is still hopeful that "together we can and must write a new and hopeful chapter in natural human history."

It is still possible to catch up, yes. But time is running out.

This article draws on the author's participation and experience as the representative of a leading independent international environmental NGO at multilateral environmental negociations throughout the post-Rio decade, particularly at the three first sessions of the Preparatory Committee for the Johannesburg Earth Summit.

Notes

1. See Greenpeace International, 2001,"Safe Trade in the 21st Century, The Doha Edition" *(www.greenpeace.org/politics/wto).*
2. This article was written following the Third Session of the Preparatory Committee for the WSSD (April 2002) and before the Fourth Session in Bali (May-June 2002).
3. Venezuela chairs the Group of 77 this year.
4. See "Clean Energy for Sustainable Development: Choose Positive Energy", briefing by Greenpeace International and the WWF for the Preparatory Committee for the WSSD *(www.greenpeace.org/earthsummit).*
5. In 2001 President Bush ordered a review of the IPCC conclusions by the National Academy of Science, which supported the published IPCC conclusions.
6. UNGA Resolution A/RES/55/199 of 20 December 2000.
7. See ECO, "Calling All Ministers!!!", Earth Summit Prepcom 3 Negotiations, New York, 2 April *(www.greenpeace.org/earthsummit/docs/eco2.pdf).*
8. *www.johannesburgsummit.org/html/documents/prepcom3docs/summary_partnerships_annex_050402.do* ◆

The GRI, a new UNEP collaborating centre

One key to sustainable development is ensuring that sustainability can be measured and reported. For reports to be widely accepted, they need to be credible, comparable and verifiable. To this end, UNEP, in partnership with CERES (Coalition for Environmentally Responsible Economies) — and with the support of many other organizations — launched the Global Reporting Initiative (GRI) in 1997 to develop and disseminate universally applicable voluntary guidelines for disclosure by companies and organizations around the world.

The GRI Guidelines are a practical tool for reporting on the economic, environmental and social dimensions of activities, products and services. Their design has involved extensive consultation with, and active participation by, corporations, NGOs, accountancy groups, business associations, universities and other stakeholders worldwide.

The first draft of the GRI Sustainability Reporting Guidelines on Economic, Social and Environmental Performance was produced in March 1999, and the latest version in June 2002. Supplements to the guidelines are being developed for the mining, finance and automotive sectors and for tour operators through UNEP voluntary initiatives with various industry sectors. (See www.globalreporting.org for more information.)

A generally accepted framework for sustainability reporting such as the GRI Guidelines will benefit companies by giving them the information they need to make sustainability-related decisions, boost performance and communicate better with stakeholders. It will help investors by improving their ability to assess intangible but significant determinants of value. Customers will be better equipped to take sustainability into account in purchasing decisions. Governments could use sustainability information to negotiate agreements and monitor progress towards targets. NGOs' priority-setting and monitoring will be enhanced. Rating agencies will have better information for benchmarking and best practice analysis.

Today more than 200 companies worldwide are using the guidelines to prepare public reports, and more than 1,500 stakeholders from 53 countries are involved in the GRI network. A permanent GRI Secretariat — recognized as a UNEP Collaborating Centre — is being established in Amsterdam.

The members of the GRI Board of Directors come from business, NGOs, international organizations and labour (though they serve in their capacity as individuals). The GRI is also supported by a Stakeholder Council, representing environmental, human-rights and other interests from around the world, and by a Technical Council.

The board members are:

Roger Adams (United Kingdom), Executive Director — Technical, Association of Chartered Certified Accountants

Jacqueline Aloisi de Larderel (France), Assistant Executive Director, United Nations Environment Programme, Division of Technology, Industry, and Economics

Fabio Feldmann (Brazil), former Secretary of Environment, São Paulo

Toshihiko Goto (Japan), Chair, Environmental Auditing Research Group

Judy Henderson (Australia), former Chair, Australian Ethical Investment Ltd., and former Commissioner, World Commission on Dams

Hanns Michael Hölz (Germany), Global Head - Sustainable Development and Public Relations, Deutsche Bank Group

Jamshed J. Irani (India), Director, Tata Sons Limited

Robert Kinloch Massie (United States), Executive Director, Coalition for Environmentally Responsible Economies

Sir Mark Moody-Stuart (United Kingdom), retired CEO, Royal Dutch/Shell

Anita Normark (Sweden), General Secretary, International Federation of Building and Wood Workers

Nyameko Barney Pityana (South Africa), Vice-Chancellor, University of South Africa and former Chair, South African Human Rights Commission

Barbara Shailor (United States), Director of International Affairs, American Federation of Labor-Congress of Industrial Organizations

Bjorn Stigson (Sweden), President, World Business Council for Sustainable Development

Peter H.Y. Wong (China), Senior Partner, Deloitte Touche Tohmatsu, Hong Kong, and Board Member, International Federation of Accountants

Foundations (notably the United Nations Foundation) have provided most of the funding for the GRI, but hundreds of corporate, NGO, multilateral, governmental and other organizations have contributed substantial in-kind resources by participating in the GRI's Steering Committee, working groups and conferences. Furthermore, the GRI has formed a Charter Group made up of organizations with a demonstrated commitment to the GRI. ◆

The Global Compact: learning to manage globalization

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Summary

The Global Compact was first proposed by UN Secretary-General Kofi Annan in an address to the World Economic Forum in January 1999. Business leaders were challenged to help build the social and environmental foundation needed to sustain the new global economy and make globalization work for all the world's people. The Global Compact is not a regulatory instrument or code of conduct, but a value-based learning model. It engages the private sector to work with the UN (in partnership with international labour and NGOs) to identify and promote good corporate practices based on universal principles.

Résumé

Le « Pacte mondial » a été proposé pour la première fois en janvier 1999 par le Secrétaire général des Nations Unies, Kofi Annan, dans un discours prononcé au Forum mondial de l'économie. Il mettait les chefs d'entreprises au défi d'aider à poser les fondements sociaux et environnementaux nécessaires pour soutenir la nouvelle économie mondiale et faire en sorte que la mondialisation bénéficie à tous les peuples de la Terre. Le « Pacte mondial » n'est ni un instrument réglementaire ni un code de conduite ; c'est un modèle d'apprentissage basé sur des valeurs. Il invite le secteur privé à travailler avec les Nations Unies (en partenariat avec des organisations syndicales internationales et des ONG) pour définir et promouvoir au sein des entreprises des bonnes pratiques basées sur des principes universels.

Resumen

El Secretario General de las Naciones Unidas, Kofi Annan, anunció por primera vez el Pacto Mundial en el Foro Económico Mundial en enero de 1999. Se desafió a los líderes empresariales a colaborar en la definición del marco social y ambiental requerido para sustentar la nueva economía global y lograr que todas las personas puedan beneficiarse de las ventajas de la globalización. El Pacto Mundial no es un instrumento regulatorio ni un código de conducta, es un modelo de aprendizaje basado en los valores. Compromete al sector privado a trabajar junto con las Naciones Unidas (en asociación con organizaciones sindicales internacionales y organizaciones no gubernamentales) en la identificación y promoción de prácticas corporativas ventajosas basadas en principios universales.

Historically, the industrialized countries were very slow to learn the lesson that markets must be embedded in broader frameworks of social values and shared objectives if they are to survive and thrive. When they finally did – in response to the collapse of the Victorian era of globalization, the Great Depression and two world wars – they called this new understanding by different names (e.g. the New Deal, the social market economy, social democracy). However, the underlying idea was the same: a grand social bargain whereby all sectors of society agreed to open markets (which in many places had become almost administered if not autarchic) and *also* to sharing the social adjustment costs that open markets inevitably produce.[1]

Governments played a key role, moderating the volatility of transaction flows across borders, providing social investments, safety nets and adjustment assistance – and all the while pushing liberalization. In the industrialized world this produced the longest period of sustained and equitable economic expansion in human history, from the 1950s to the present.

But here is the problem we face today: that grand bargain presupposed an *international* world; we have come to live in a *global* world. It presupposed the existence of *national* economies, engaged in *external* transactions, which governments could mediate at the *border* by tariffs and exchange rates, among other tools; but markets have gone global, leaving behind merely national social bargains. Economic globalization has increasingly disconnected one single element – networks of production and finance – from what had been an overall system of institutional relations, and sent it off on its own spatial and temporal trajectory. The recent backlash against globalization has grown in direct proportion to the divergence between global markets and national communities.

I am not suggesting that the current wave of globalization will implode just as its 19th century predecessor did. Many of the fundamentals are quite different. But I would venture two predictions. One is that the present state of affairs is not sustainable. The inequalities are too great, the social disruption too intolerable. The gap between market and community *will* be closed; the only issue is how and in which direction. My second prediction is that rollback, a shift away from globalization, is the more likely outcome unless we manage to strengthen the fabric of global community.

The world needs open markets: business in order to maximize its opportunities, the industrialized countries in order to sustain prosperity, and the developing countries because an open world economy provides the only hope for pulling billions of poor people out of abject poverty. A central challenge of our day is to learn how to do at the global level what the industrialized countries accomplished at the national level in the 20th century. The corporate sector has a key role to play in that process. The UN's Global Compact, described by the *Christian Science Monitor* as Kofi Annan's "most creative reinvention yet" at the United Nations, is intended to help it do so.

The Global Compact

The Global Compact (GC) engages the private sector directly to work with the UN,[2] in partnership with international labour and NGOs, to identify and promote good corporate practices based on universal principles.

The GC encompasses nine such principles:

- support and respect for the protection of internationally proclaimed human rights;
- non-complicity in human rights abuses;
- freedom of association and the effective recognition of the right to collective bargaining;
- elimination of all forms of forced and compulsory labour;
- effective abolition of child labour;
- elimination of discrimination in respect of employment and occupation;
- a precautionary approach to environmental challenges;
- greater environmental responsibility; and
- encouragement of the development and diffusion of environmentally friendly technologies.

These principles are drawn from the Universal Declaration of Human Rights, the International Labour Organisation's Fundamental Principles on Rights at Work, and the principles set out in the Rio Declaration on Environment and Development.

Companies are challenged to act on these nine principles in their own corporate domains, moving towards "good practices" as understood by the broader international community, rather than

relying on their often superior bargaining position vis-à-vis national authorities, especially in small and poor states, to get away with less.

Specifically, companies are asked to undertake three commitments:

- to advocate the Compact and its nine principles in mission statements, annual reports and similar public presentations, on the premise that doing so will raise the level of attention paid to (and the responsibility taken for) these concerns within firms;
- to post on the GC web site[3] at least once a year concrete steps they have taken to act on any or all of the nine principles, discussing both positive and negative lessons learned – and triggering, thereby, a structured dialogue among the various participants about what deserves to be labelled as a good practice;
- to join with the UN in partnership projects of benefit to developing countries, particularly the least developed, which the forces of globalization have largely marginalized.

Companies initiate participation in the Compact by having their Chief Executive Officer send a letter to the Secretary-General expressing their commitment, a step that typically requires Board approval. Since a kick-off event in July 2000, some 400 companies worldwide (based in Europe, the United States, Japan, Hong Kong, India, Brazil and elsewhere) have engaged in the GC. The target is 1000 firms within three years.

The GC learning forum

How does the GC propose to induce corporate change?

Its core is a learning forum. Companies submit case studies on what they have done to translate their commitment to the GC principles into concrete corporate practices. This occasions a dialogue among GC participants from all sectors: the UN, business, labour and civil society organizations. The aim of this dialogue is to reach broader consensus-based definitions of what constitutes good practices than any of the parties could achieve alone. Those definitions, together with illustrative case studies, are then publicized using an on-line information bank, which will become a standard reference source on corporate social responsibility.

The hope and expectation is that good practices will help drive out bad ones through the power of dialogue, transparency, advocacy and competition.

Why did the Secretary-General choose this approach rather than proposing a regulatory code, complete with monitoring and compliance mechanisms? First, the probability of the General Assembly's adopting a meaningful code anytime soon approximates zero. The only countries eager to launch such an effort at this time are equally unfriendly to the private sector, human rights, labour standards and the environment.

Second, the logistical and financial requirements for the UN to monitor global companies and their supply chains, let alone small and medium-sized enterprises at national levels, far exceed its capacity. For example, Nike, whose past labour practices have made it a frequent target of protesters, has more than 750 suppliers in 52 countries, and it is at the lower end among comparable firms in the number of factories as a fraction of its revenue base.[4]

The following thought experiment illustrates the full magnitude of the task. A Hong Kong-based firm currently performs social audits ("Social Accountability 8000") for a number of US specialty and retail chains that source their products in China. It employs approximately 250 field technicians to monitor the production of $1 billion in products. If we were to multiply that ratio for all US consumer products imports, the field staff requirement would amount to 55,000 technicians. That already is larger than the worldwide staff of the entire United Nations and all of its specialized agencies combined. But we would still need coverage of imports of consumer products into all other countries, plus global imports from the extractive industries. The scale is mind-boggling.

Third, any UN attempt to impose a code of conduct would not only be opposed by the business community, but would also drive progressive business leaders into a more uniform anti-code coalition.

But these strictly pragmatic reasons imply that a learning-based approach is merely a second-best solution. In fact, a far stronger intellectual case can be made for it.

Many of the GC's principles cannot be defined at this time with the precision required for a viable code of conduct. No consensus exists on what "the precautionary principle" is (i.e. the principle that in the face of environmental uncertainty the bias should favour avoiding risk), even though it was enshrined at the 1992 Rio Conference. Similarly, no consensus exists, even among advocates, on where to draw the boundaries around corporate "non-complicity" in human rights abuses. Accumulated experience, through trial, error and social vetting, will gradually fill in the blanks. The GC learning forum provides that experience.

Moreover, the extraordinary pace of change in corporate strategies, structures and production processes makes it exceedingly difficult to specify *ex ante* the full range of performance criteria and desired practices that a code should include. In contrast, the GC learning forum helps companies internalize the relevant principles so that they can shape and reshape corporate practices as external conditions change. Employees are turning out to be vital allies in this process.[5]

Finally, the accumulation of experience itself is likely to lead gradually to a desire for greater codification, benchmarking and moving from "good" to "best" practices, including by industry leaders who want to protect themselves against any possible competitive disadvantage. Laggards will have a harder time opposing actual achievements by their peers than *a priori* standards.

Thus, there are both pragmatic and principled reasons why the GC adopted a learning model rather than regulation to induce corporate change. Nevertheless, there are certain things that such an approach cannot achieve. The fact that the GC recognizes and promotes a company's "good practice" provides no guarantee that the same company does not engage in "bad" ones elsewhere. Indeed, it may even invite a measure of strategic behaviour. Nestlé's recent interest in the GC, for instance, undoubtedly reflects a desire to balance criticism related to its breast milk substitute, including from the UN (Unicef). Nor does a learning model have any direct leverage over determined laggards. They require other means, ranging from legislation to direct social action.

In sum, the GC's strengths and weaknesses both stem from its having adopted a model that promotes learning by recognizing and reinforcing leadership. It helps create and build momentum towards its universal principles, but is unlikely to get there by itself.

Inter-organizational networks

Organizationally, the GC is an expanding set of nested networks. The participating UN entities constitute one of these. The Global Compact office in New York is by far the smallest component; its main functions are to provide strategic direction, policy coherence and quality control.

The core network comprises the UN and the other participants: companies, international labour, transnational NGOs, and university-based research centres. Most of the heavy lifting gets done here.

The Global Compact has triggered several complementary regional, national and sectoral initiatives. Typically, they take a subset of interested GC participants beyond its minimum commitments. For example, Norway's Statoil and the International Federation of Chemical, Energy, Mine and General Workers' Unions recently reached an agreement within the GC framework whereby Statoil will extend the same labour rights (as well as health and safety standards) it applies in Norway to all overseas operations, including those in Viet Nam, Venezuela, Angola and Azerbaijan.

Finally, a number of initiatives intended for other purposes have associated themselves with the GC. Such business associations as the International Chamber of Commerce, the Prince of Wales Business Leadership Forum, the International Organization of Employers, and the World Business Council for Sustainable Development support the GC in various ways. The most unusual of these partnerships is with the multi-stakeholder Committee for Melbourne, which is incorporating the GC into the strategic plan it is developing for that Australian city.

Accordingly, the Global Compact exhibits many of the defining attributes of inter-organizational networks (ION),[6] which should be better understood by critics and advocates alike:

- IONs are formed by autonomous organizations combining their efforts voluntarily to achieve goals they cannot reach as effectively or at all on their own. They rest on a bargain, not coercion. The GC's underlying "bargain" is that the UN provides a degree of legitimacy and helps solve coordination problems, while the companies and other social actors provide the capacity to produce the desired changes.
- IONs typically come into being to help their participants understand and deal with complex and ambiguous challenges. They are inherently experimental, not routine and standardized. Few

challenges are more complex and ambiguous than internalizing the GC's principles into corporate management practices.

- IONs "operate" as shared conceptual systems within which the participating entities perceive, understand and frame aspects of their behaviour. But the existing actors do all the doing that needs to be done. The GC creates no new entities, but is a framework for normatively coordinated behaviour to produce a new collective outcome.
- IONs must be guided by a shared vision and common purpose. The Secretary-General is responsible for sustaining that vision and ensuring that network values and activities are compatible with it.
- IONs are loosely coupled organizational forms, resting on non-directive horizontal organizing principles. Its participants meet when they need to do so, and in formats required to conduct their work.

The major advantage of the GC's network approach is its capacity to respond to the complex and rapidly changing environments that the UN seeks to affect. The UN otherwise lacks that capacity, as do governments, firms and civil society organizations acting alone or in a different format.[7]

Again, the GC's chief weakness is the same as its main strength. It *is* a network of autonomous actors, each with different interests and needs that intersect only partially. Criticism of the GC for partnering with business fails to appreciate the advantages of inter-organizational networks. But by the same token, anyone who sees in the GC the cure for globalization's many ills does not sufficiently grasp the fragile basis of all such networks.

The business of business

At this point, a business leader might well ask: Why me? Isn't the business of business – well, business? Shouldn't governments take care of governance gaps? Indeed, sceptics of voluntary initiatives might well ask the same questions.

Of course, governments should govern. Voluntary initiatives in corporate social responsibility are no substitute for effective action by governments, alone or in concert. Indeed, governance failures – the unwillingness or inability of governments to live up to their own commitments – are among the main reasons that the consequences of globalization are so painful.

But society finds itself in a bit of a race against the clock. Globalization is operating on Internet time, while governments do not and probably cannot. By definition no government has full and legitimate global reach. This means they have to engage in inter-governmental negotiations – the outcomes of which are often determined by the lowest and slowest common denominator.

So society increasingly looks to the business community to couple its new global rights and power with new global responsibilities.

But beyond that, it is actually good business to step up.

The most basic rationale is the protection and promotion of a company's brand in the face of new social expectations. Increasingly, it pays for companies to do "good" things and to be seen to do them.

Some companies have done "bad" things in the past. They have paid a price in public embarrassment and perhaps even diminished sales or stock values. Now they want to pursue a different path. Think of Nike or Shell. Others want to make sure they don't repeat the errors their peers have committed. For example, BP Amoco is working hard in Angola to avoid Shell's errant ways in Nigeria.

Some companies have come to view global corporate social responsibility as a natural extension of CSR in their home countries, as one of the rules of the game in the new global marketplace. It is probably no coincidence that the earliest of the first movers to support the Global Compact were companies based in Scandinavia.

Still others (particularly companies in cutting edge industries, where attracting absolutely the best personnel worldwide is the key to success) have found that they cannot sufficiently motivate the very best people with monetary rewards alone. In these cases, more elevated social purposes are becoming part of corporate culture.

In the environmental area companies have discovered entirely new profit centres and developed entirely new businesses in response to the quest for greater "eco-efficiency", squeezing more use out of raw materials in the production process as well as out of waste by-products. The somewhat broader concept of life-cycle management – expanding the search for these efficiencies further upstream and downstream – is also beginning to take root.

Finally, business has collective interests that are furthered by adopting an active global Corporate Social Responsibility (CSR) posture. Quite simply, the more effective the CSR, the less the pressure will be to accomplish the same ends by other (and potentially far less friendly) ways. The alternatives include having the whole bundle of social and environmental issues thrown into the World Trade Organization, regional trade pacts or national trade legislation, where they would become part and parcel of the tit-for-tat of a new protectionism.

In short, *business* created the single global economic space; business can and must help sustain it. And corporate social responsibility – through the Global Compact or some other vehicle – offers one viable and vital approach.

Conclusion

The Global Compact seeks to weave universal principles into global corporate behaviour. And it brings together all the relevant social actors in doing so: governments, which defined the principles on which the initiative is based; companies, whose behaviour the GC seeks to shape; labour, in whose hands the concrete process of global production takes place; NGOs, representing the wider community of stakeholders; and the United Nations, the world's only truly global political entity.

It is a voluntary initiative intended to induce corporate change through identifying and promoting good practices. And it does so through a network form of organization.

The Compact is not the only way to achieve those aims. But it does constitute a prototype of one way, the strengths and weaknesses of which need to be better understood by analysts and activists alike because it will become a more prevalent response to the challenge of closing global governance gaps in the years ahead.

From 1997 to 2001 the author was Assistant Secretary-General and senior advisor for strategic planning to UN Secretary-General Kofi Annan. His responsibilities included the Global Compact. This article is based on a keynote address at the July 2001 Warwick University Corporate Citizenship Conference. An expanded version appears as "The Theory and Practice of Learning Networks: Corporate Social Responsibility and the Global Compact" in the Journal of Corporate Citizenship, 5 (Spring 2002).

Notes

1. In academic circles this grand bargain is known as "the embedded liberalism compromise". See John Gerard Ruggie, "International Regimes, Transactions and Change: Embedded Liberalism in the Postwar Economic Order," *International Organization*, 36 (Spring 1982).
2. GC participants include the UN (the Secretary-General's Office, Office of the High Commissioner for Human Rights, International Labour Organisation, UN Environment Programme and UN Development Programme); the International Confederation of Free Trade Unions (ICFTU); more than a dozen transnational NGOs in the three areas covered by the GC, such as Amnesty International and the WWF; as well as individual companies and international business associations.
3. *www.unglobalcompact.org*.
4. The escalating cost of monitoring Central American suppliers experienced by the large clothing chain The Gap is reported by Leslie Kaufman and David Gonzalez in "Labour Standards Clash With Global Reality," *The New York Times*, 24 April 2001.
5. A number of participating companies have set up internal websites or other discussion forums enabling employees to comment on company practices in relation to the Global Compact. A corporate-led Scandinavian workshop on diversity in the workplace resulted from one of these. On "internal branding" of this sort see Bernard Stamler, "Companies are developing brand messages as a way to inspire loyalty among employees," *The New York Times*, 5 July 2001.
6. See Rupert F. Chisholm, *Developing Network Organizations* (Addison-Wesley, Reading, Massachusetts, 1998), chapter 1. For a discussion of network-based organizations in the context of global public policy, see Wolfgang Reinicke and Francis Deng, *Critical Choices: The United Nations, Networks, and the Future of the Global Governance* (International Development Research Centre, Ottawa, 2000).
7. For example, the Global Sullivan Principles for corporate social responsibility, a partnership of American firms and some NGOs, lacks the social legitimacy of the UN. As a result, this effort has picked up little support beyond the United States. ◆

A tool for future-oriented decision making: combined monetary and biophysical indicators

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Summary

Monetary accounts capture information concerning the assets that contribute to a country's wealth, on the assumption that safeguarding wealth is indispensable to maintaining economic vitality. Biophysical accounts consider the uses of domestic and global natural capital, on the assumption that maintaining economic vitality depends on basic ecological services such as renewable and non-renewable resources, waste absorption and stable climate conditions. Used together, these two measurements provide policy makers with detailed intelligence on economic and ecological viability. Such an approach can also illuminate the relationship between national and global sustainability and identify policy responses.

Résumé

Les comptes monétaires recueillent des informations sur les actifs qui contribuent à la richesse d'un pays, en partant du principe qu'il est indispensable de sauvegarder la richesse pour entretenir la vitalité économique. Les comptes biophysiques s'intéressent aux utilisations du capital naturel mondial et national, en partant du principe que le maintien de la vitalité économique dépend de données écologiques de base, comme les ressources renouvelables et non renouvelables, l'absorption des déchets et des conditions climatiques stables. Employées ensemble, ces deux mesures donnent aux décideurs des informations détaillées sur la viabilité économique et écologique. Cette approche peut également éclairer les relations entre développement durable national et développement durable mondial, et aider à trouver des réponses politiques.

Resumen

Los valores financieros brindan información referida a los activos que contribuyen al bienestar de un país, partiendo de la premisa que poner bienes al resguardo es indispensable para preservar la vitalidad económica. Los valores biofísicos consideran los usos locales y globales del capital natural, basándose en que la preservación de la vitalidad económica depende de los servicios ecológicos básicos tales como recursos renovables y no renovables, absorción de residuos y condiciones climáticas estables. La utilización conjunta de ambos parámetros brinda información detallada sobre viabilidad económica y ecológica a los responsables de la definición de políticas. Este enfoque también permite esclarecer la relación entre sustentabilidad nacional y mundial e identificar políticas de respuesta.

Measuring real progress towards sustainable development is one of the key challenges of our time. After five decades of using GDP as a measure of the wealth of nations, it is widely accepted that while GDP does a good job of accounting for economic output, it does not account for sustainable development because critical assets are missing, particularly natural and human capital.

In response, recent research by the World Bank, the World Wide Fund for Nature (WWF) and Redefining Progress has identified a new approach to accounting for economic activity based on a combination of monetary and biophysical accounts. For decision makers seeking to choose policies for sustainable development, these complementary accounts provide a more complete toolkit than the traditional methods do. A key advantage of these innovative accounting approaches is that each is based on a consistent framework that defines common units of measure, so changes in various assets can be rigorously compared.

Monetary asset accounts

Monetary asset accounts analyze the extent to which the total per capita wealth of a nation is increasing or decreasing. Thus they measure what is known as "weak sustainability" (the idea that some loss of, say, "climate capital" could be consistent with sustainability if increases in other forms of capital compensated for the loss). **Table 1** highlights the results of such monetary accounting in per capita terms for selected countries. It details first the components of depletion and degradation of the environment – the value of depletion of minerals and mineral fuels, the value of *net* depletion of forests (i.e. where harvest rates exceed natural growth rates), and the global damage incurred when CO_2 is emitted. The sum of these figures is a crude monetary measure of depletion and degradation. This sum is juxtaposed with figures on net domestic saving – the amount of GDP that is not consumed by households and governments, less the value of depreciation of produced assets.

Comparing net saving to total depletion and damage provides an initial assessment of sustainability. It answers the question of whether countries are depleting their natural assets faster than they are building up produced assets. It provides a less than complete picture, however. A major omission in the comparison of net saving to total depletion and damage is the effect of population growth. This is shown as the final entry in Table 1. To take Zimbabwe as an example, the suggestion from the table is that net wealth actually increased by $4 per capita in 1997.

However, this somewhat larger sum of national wealth has to be shared among a Zimbabwean population that has grown by 2.1% over the course of the year, which produces a decline in wealth per capita of $207. *The intuitive conclusion to be drawn from this result is that the percentage increase in total wealth was substantially less than the percentage increase in total population.*

Biophysical accounts of natural capital

Biophysical natural capital accounts measure sustainability by evaluating to what extent humanity's demands on the biosphere, in terms of renewable and non-renewable resource consumption and waste production, exceed nature's capacity to renew itself. They are derived from material accounts[1] and the biological productivity[2] literature and assess, for any given activity, the biologically productive area required to produce the resources and to absorb the waste of that activity, using prevailing technology.[3] By taking physical limits into consideration, therefore, these biophysical accounts provide a measure of *strong sustainability*.

Table 2 provides an outline of the results, pro-

Table 1
Monetary asset accounts: results from six selected countries (depletion, damage and saving effort)

	Australia	Chile	Indonesia	Netherlands	Pakistan	Zimbabwe
Mineral and fuel depletion	-411	-335	-61	-26	-9	-24
Net forest depletion	0	0	-6	0	-7	-3
CO_2 damage	-94	-22	-7	-57	-4	-
Total depletion and damage	-505	-358	-73	-83	-20	-26
Net domestic saving	2108	678	237	4041	15	30
Effect of population growth	-3461	-913	-196	-1196	-170	207

Measured in 1997 US dollars, 1997 data. Estimates of annual change in value of some main national assets, including the impact of demographic growth on per capita wealth.

Source: World Bank estimates, derived from World Bank (1999) and Hamilton and Clemens (1999).[4]

viding key data for the same set of nations as in Table 1. The first section of the accounts captures the biological productivity of the nation – the supply of ecological services within its own borders. The second section documents the nation's uses of natural capital in various categories – its demand on ecological services. All results are presented in the same common units: global hectares – standardized hectares with world-average biomass productivity.[5] As Table 2 shows, in some cases nations' demand on nature is smaller than their domestic supply, and in some cases it is larger.

It is worth noting that a distinct advantage of the biophysical approach is that it offers a broader, more global perspective on sustainability. This is important, because many of the environment-related issues of sustainability do not respect national borders. In this context, Table 2 sheds light on some of the biophysical difficulties inherent in measuring sustainable development. According to this analysis, the Earth provides 2.2 hectares of bioproductive space per world inhabitant. In contrast, the average consumption of the world citizen requires 2.8 global hectares, or 1.3 times more. This means that, currently, it takes the biosphere 1.3 years to regenerate what humanity consumes within one year. CO_2 is responsible for half of the impact: it would take about 1.4 global hectares per person to either sequester the excess CO_2 or produce the same energy with plant matter. As demand (consumption) exceeds supply (biocapacity), the world's natural capital is being depleted. Examples are deforestation, freshwater scarcity, fisheries decline, or CO_2 accumulation in the atmosphere.

For countries, the accounts can reveal specific vulnerabilities. Take the example of Australia. This country is endowed with 42 hectares of land per inhabitant, of which 34 are biologically productive. This biocapacity corresponds to merely 9.3 global hectares per Australian, primarily due to water scarcity. In contrast, Australia's vast transportation infrastructure, large share of coal energy, and high consumption of animal products boosts its demand on nature to an equivalent of 8.5 global hectares per Australian, slightly less than the 9.3 global hectares of biocapacity.

The same accounts applied to Zimbabwe reveal a somewhat different picture. For this country, the accounts show 3.5 hectares of land per Zimbabwean. However, due to water scarcity and poor soils, the biomass productivity of these hectares is low. Hence these 3.5 hectares per person correspond to only 0.7 global hectares per Zimbabwean – these are hectares with global average bioproductivity. This biocapacity is half of what is required for producing the resources and absorbing the waste associated with the consumption of an average Zimbabwean. A significant portion of the difference between the available biocapacity and the Zimbabwean use of biocapacity stems from the overexploitation of domestic forest resources.

A variety of sub-indicators can be drawn from the national biophysical accounts. For example, they can show how much of the biological capacity (in various ecosystems categories) is used for producing all the goods and services of a country, or how much biological capacity is supplied from local sources and how much is imported or exported. Or they can track how efficiently nations use their resources in order to determine the contribution of technological improvements to mitigate the impact of human activities.

Monetary and biophysical accounts as complements

A key advantage of monetary accounting is the presumption that "a dollar is a dollar" – that is, one dollar's worth of two different goods can be presumed to yield the same amount of well-being to the consumer. This does not, however, question the importance of information on physical quantities. Information on physical scarcity (reserves of minerals, for example) is often critical in determining economic efficiency. Biophysical information on stock sizes and growth rates for living resources sets the basic conditions for optimal harvest of these resources.

Both accounts provide national averages – but could with more research also generate data about sectors and income groups. While nations are never homogeneous, national average figures as provided by the two accounts offer nevertheless important information for national policy making.

Biophysical and the monetary accounts are also complementary with regard to scale. Monetary accounts are powerful at the micro level from households up to nations, but have limitations at the global level. At the global level, biophysical measures can better capture transboundary effects and the health of the planet as a whole. For instance, embedded carbon flows can be factored into a country's biophysical profile. In contrast, global monetary aggregates are often bereft of

Table 2
Biophysical natural capital accounts: results from six selected countries and the world

	Australia	Chile	Indonesia	Pakistan	Netherlands	Zimbabwe	World
Population (in millions)	18	14	200	140	16	11	5745
Supply							
Physical land area (hectares/capita)	42.3	5.2	0.9	0.6	0.2	3.5	2.3
Multiply by % of land bioproductive (%)	80%	44%	88%	39%	85%	75%	72%
Add physical area of bioproductive sea (hectares/capita)	8.1	5.2	0.9	0.1	0.2	0.0	0.6
= Total bioproductive area (hectares/capita)	41.9	7.5	1.7	0.3	0.4	2.6	2.2
Multiply by relative bioproductivity* (-)	0.22	0.27	1.90	2.31	6.39	0.26	1.00
Total biocapacity supply (global hectares/capita)**	**9.3**	**2.0**	**3.2**	**0.7**	**2.3**	**0.7**	**2.2**
Demand (in global hectares per capita)							
Agriculture	2.6	1.2	0.6	0.7	2.1	0.7	1.0
Forest products	0.6	0.6	0.3	0.1	0.5	0.3	0.3
Fish products	0.06	0.11	0.04	0.00	0.05	0.01	0.04
Built-up area	0.4	0.1	0.1	0.0	0.3	0.0	0.1
CO_2 emissions	4.8	1.1	0.4	0.3	3.7	0.4	1.4
Total biocapacity demand (global hectares/capita)	**8.5**	**3.1**	**1.4**	**1.1**	**6.6**	**1.4**	**2.8**

* "Relative bioproductivity" indicates by which factor national ecosystems are more productive per hectare than the world average.

** "Global hectares" are hectares with world average biomass productivity.

Measured mostly in global hectares, 1996 data. The upper part of the table provides estimates of the biological capacity available in the country by adjusting its land and sea area for its biomass productivity. Hence biocapacity can be expressed in the common units of global hectares. The lower part of the table documents the use of biocapacity in various subcategories.

Source: Redefining Progress, based on primary data from UN agencies[6]

Table 3
Interpreting selected countries with both accounts

	Accounting for nations' change in wealth (measured with the monetary accounts)	Accounting for nations' use of ecological capacity (measured with the biophysical natural capital accounts)
Australia	Australia is a major producer of minerals and mineral fuels, reflected in resource depletion of $411 per capita per year. Dispersed population and dependence on coal lead to high CO_2 damage per person. Domestic saving rates per person of over $2100 are relatively low for its income level, while wealth loss owing to population growth is higher than for most other high-income countries.	Australia is endowed with 42 hectares of land per inhabitant, of which 34 are biologically productive. This biocapacity corresponds to merely 9.3 global hectares per Australian, primarily due to water scarcity. In contrast, Australia's vast transportation infrastructure, large share of coal energy, and high consumption of animal products boosts its demand on nature to an equivalent of 8.5 global hectares per Australian, slightly less than the 9.3 global hectares of biocapacity.
Chile	Chile is a leading producer of copper, resulting in an annual $335 depletion per capita. CO_2 damages are typical for their income level. Domestic saving effort is strong, but not able to fully compensate for per capita wealth loss owing to population growth.	Chile controls 5.2 hectares of land and about 5 hectares of productive sea area per citizen. These areas have a biocapacity of 2.0 global hectares per Chilean. This is two-thirds the biocapacity needed to regenerate what the average Chilean consumes. Resource consumption within Chile is unequally distributed: the wealthiest 20% consume resources at the level of an average US citizen.
Indonesia	Indonesia, a major oil exporter, depletes $61 of mineral and energy resources a year for each of its 200 million inhabitants. Forest use exceeds natural growth at a rate of $6 a year per Indonesian. CO_2 damage is at a similar level. The saving effort is strong, more than offsetting the per capita wealth loss owing to population growth.	The 0.8 hectares of bioproductive land per Indonesian have the capacity of 3.2 global hectares due to the country's high humidity and fertile soils. In contrast, all resource uses combined correspond to 1.4 global hectares per Indonesian, or less than half of its maximum capacity.
Pakistan	Pakistan depletes minerals and energy at $9 a year per citizen. Forest harvest exceeds natural growth by a similar amount. CO_2 damage per capita is in the range of other low-income countries. Total depletion and damage more than offset net saving effort, but are overshadowed by the loss of per capita wealth owing to population growth.	Out of the 0.5 hectares land area per Pakistani, only 0.2 are biologically productive. Due to their intensive use and productive soils, these areas correspond to the biocapacity of 0.7 global hectares. Despite modest consumption levels, the average Pakistani's demand of 1.1 global hectares still exceeds the nation's capacity, making it dependent on imports of ecological services and depletion of natural capital stocks.
Netherlands	The Netherlands depletes its energy resources at moderate per capita levels, while its CO_2 damage per capita is notably lower than that of Australia (partly owing to higher population density). Savings effort is strong, far exceeding the reduction of per capita wealth due to population growth.	Fertile soil, humid climate, and intensive land use boost the actual 0.2 hectares per Dutch person to an equivalent of 2.3 global hectares. Still, the Dutch demand exceeds this biocapacity threefold. The gap between biocapacity and demand is bridged with imports.
Zimbabwe	Zimbabwe has moderate levels of mineral depletion at $24 per person, and forest harvest (mostly for fuel wood) exceeds natural growth. Total depletion roughly offsets the saving effort, leaving the country substantially poorer in per capita terms once the effect of population growth is included.	Due to water scarcity and poor soils, the 3.5 hectares of land per Zimbabwean is only worth 0.7 global hectares. This is only half of what is necessary to maintain the resource flow of the average Zimbabwean. The difference stems partly from overuse of forests.
World	Rough calculations[7] suggest that there is a slight net loss of total wealth per person across the globe, amounting to roughly 0.1% of global wealth annually. However, this global average masks the fact that estimated declines in wealth per capita are sizable in roughly 50 countries.	The Earth offers 2.2 (global) hectares of bioproductive space per world citizen. In contrast, the average world citizen demands 2.8 global hectares. The difference indicates liquidation of the world's natural capital (such as forest depletion, fisheries decline, or CO_2 accumulation in the atmosphere).

meaning. To take just one example, global average income per capita is roughly $6000, a figure that masks enormous disparities in income.

Biophysical accounts, in contrast, while useful at the global level, may be less helpful to policy makers at the household level. On the global scale they can address critically important questions. For example, by what amount does global emission of CO_2 exceed the ability of terrestrial and aquatic systems to absorb it? Or, what are the productivity trends of the world's natural capital assets?

When used in tandem, the two accounts provide policy makers with a wealth of information. Taken together, they represent valuable *tools for policy makers* by addressing specific concerns relevant to sustainability: how a nation's wealth is changing over time, and what amount of biological capacity it is using. In particular, this tool can assist in identifying the cost of depleting natural capital assets; the cost of demographic growth; the intensity of use of local ecosystems, which links directly to pressure on biodiversity; and the distribution of resource use among nations.

These accounts also offer *a common platform for comparing significant sustainability issues* by tracking them in each accounting system with a common measurement unit. Using a common framework allows analysts to address issues in concert rather than in isolation, and helps to identify possible synergies and trade-offs.

In addition to providing a country analysis and highlighting critical issues, the two accounts also assist in *identifying policy priorities*. With limited budgets, either financial or biological, difficult trade-offs are inevitable. Comprehensive frameworks like this help explore the implications of such choices and assist policy makers to prioritize competing needs.

Furthermore, such a complementary approach also supports the *development of policy responses*. The accounts offer platforms for designing policy packages that produce multiple benefits and address the needs of a variety of sectors and the responsibilities of several agencies. They can, for example, assist in the development of environmental policy prescriptions such as improving the pricing of resources and pollutants by capturing, *inter alia*, royalties on mineral and energy extraction, and by enforcing property rights. Such policies improve the efficiency of environmental services[8] since they reduce incentives to overexploit resources or to pollute indiscriminately.

The natural capital accounts support policy interventions that aim at reducing human use of nature to a level that can be sustained by nature. Since overall use is determined by four factors – population levels, people's consumption patterns, the eco-efficiency with which consumption items are produced, and the robustness of natural capital stocks to withstand degradation – each becomes an area for policy intervention. The tools are the same. For example, policies aimed at reducing carbon intensity include carbon taxation, fuel taxation, trading of carbon emissions and sequestration, and subsidies to technologies that are less carbon-intensive. These policies can complement efforts to improve the monetary accounts of a country, for example where reducing carbon emissions also reduces local air pollution and its associated costs.

In summary, even though these frameworks share one significant limitation – the amount of internationally comparable data available at the national level that are reliable and relevant to the accounts – used in tandem the two measures help track a country's progress towards sustainable development, highlight critical issues and identify policy responses. Therefore, they not only illuminate the relationship between national and global sustainability but also help improve policy making for sustainable development.

This article draws heavily on "Accounting for Sustainable Development: Complementary Monetary and Biophysical Approaches" by Mathis Wackernagel, Kirk Hamilton, Jonathan Loh and Jerome Sayre (November 2001), prepared for the OECD Roundtable on Sustainable Development. By permission of the authors.

Notes

1. E. Matthews, et al. (2000). *The Weight of Nations – Material Outflows from Industrial Economies*. World Resources Institute, Washington, D.C.
2. Peter M. Vitousek, Paul R. Ehrlich, Ann H.

Ehrlich and Pamela A. Mateson (1986) Human Appropriation of the Products of Photosynthesis. *BioScience* 34:6, 368-373.

3. Parts of this area can be located all over the world. Its size depends not only on the amount of resources used, but also on the efficiency by which the resources are harvested and processed.

4. World Bank (1999) *World Development Indicators 1999*. The World Bank, Washington, D.C. Note that savings figures have been revised since the publication date. See also K. Hamilton and M. Clemens, Genuine Saving in Developing Countries, *World Bank Economic Review*, 13:2 (1999), 33-56.

5. Each global hectare represents the average regenerative capacity of each of the 11.6 billion biologically productive hectares on the planet. These 11.6 billion bioproductive hectares, including 3.2 billion hectares of coastal areas and upwelling zones, host over 90% of the world's bioproductivity. The remaining 39.3 billion hectares that make up the surface of planet Earth – such as Antarctica, the Sahara or the deep oceans – provide hardly any biomass production and are host to little life.

6. For more details, consult World Wide Fund for Nature International (WWF), UNEP World Conservation Monitoring Centre, Redefining Progress, Center for Sustainability Studies, *Living Planet Report 2000*, WWF, Gland, Switzerland, 2000.

7. For more details, see Kirk Hamilton, *Sustaining Economic Welfare: Estimating Changes in Per Capita Wealth*, Policy Research Working Paper No. 2498, World Bank, Washington, D.C., 2001.

8. Efficient pollution policies aim at investing in pollution abatement up to the point where the marginal cost of abatement begins to exceed the marginal cost of pollution damage. ◆

Trade unions and sustainable development

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Summary

Government, industry (including trade unions) and the community must all be involved in efforts to change unsustainable production and consumption patterns. Greater understanding of trade unions' unique nature, and of linkages between the different elements of sustainability, can lead to more effective actions and stronger partnerships for change. The economic and social restructuring required for sustainable development adds a new dimension to the contradictory choices workers have always faced between physical and economic survival.

Résumé

Les gouvernements, l'industrie (y compris les syndicats) et les citoyens doivent participer aux efforts nécessaires pour changer les modes de production et de consommation qui sont incompatibles avec un développement durable. Une meilleure compréhension de la spécificité des syndicats et des liens entre les différentes composantes du développement durable permettrait des actions plus efficaces et des partenariats plus solides pour impulser le changement. Condition indispensable du développement durable, la restructuration économique et sociale confère une nouvelle dimension au choix contradictoire entre survie physique et économique auquel les travailleurs ont toujours été confrontés.

Resumen

Gobierno, industria (incluyendo las organizaciones sindicales) y comunidad deben estar involucrados en los esfuerzos por cambiar los patrones de producción y consumo no sustentables. Un conocimiento más profundo acerca de la naturaleza intrínseca de los sindicatos y de los vínculos existentes entre los diferentes componentes de la sustentabilidad, puede impulsar acciones más eficaces y la creación de asociaciones más poderosas para promover el cambio. La reestructuración económica y social requerida para el desarrollo sustentable agrega una nueva dimensión a la disyuntiva que siempre han debido enfrentar los empleados entre la supervivencia física y la económica.

In remarks to a meeting of leaders of business, trade unions and other elements of civil society on 26 July 2000, UN Secretary-General Kofi Annan, describing the roles of the three groups of partners in his Global Compact initiative, spoke of the contribution of trade unions in the following terms: "Labour unions can mobilize the workforce – for after all, companies are not composed only of their executives."

There is much in this short phrase, but two notions are of particular relevance to sustainable development. First, it expresses the important truth that trade unions are part of industry as well as civil society. Second, it stresses the role of mobilization, central to achieving (rather than just talking about) sustainable development. Dialogue, partnership and mobilization must involve government, both sides of industry and the community if we are to change the unsustainable patterns of production and consumption that threaten our planet. Better understanding of the unique nature of trade unions – and of linkages between various elements of sustainability – can lead to more effective action and stronger partnerships for change.

Workers and their trade unions have a great stake in social, environmental and economic decision-making. They also have a stake in a sustainable process that will lead to sound decisions. Workers are often the first to be affected, not only by dangerous substances and other hazards (the ILO estimates that 1.3 million workers are killed every year due to occupational accidents or injuries) but also by ill-conceived policy decisions for change.

The economic and social restructuring necessary for sustainable development gives a new dimension to the contradictory survival choices workers have always faced. Workers are caught between physical survival (because of short or long-term risks to themselves and their families) and economic survival for themselves, their families and their communities. Reconciling these needs requires worker representation. Proposals for sustainable development will not be practical unless trade unions are at the table and alternatives are developed that clearly accommodate both sets of survival needs. During the process leading to sustainable development, there should be a relationship between what is on the table and who is around it.

Economic, social and environmental development

The economic, social and environmental dimensions of development are linked in our daily lives; it is an artificial, if entrenched, notion that they can be separated. The dialogue and policy-making that have emerged around the concept of sustainable development are beginning to link policy with reality and represent the first concerted attempt to integrate all three dimensions.

Proposals to integrate the three dimensions of sustainable development must begin with realistic expectations of what the market and individual companies will accomplish on their own, even with the best intentions. Markets do not clean up after themselves. Neither do they automatically produce justice, or require respect for human rights in order to prosper or function.

Integration requires a leading role for government and responsible governance at local, national and international levels. History has yet to provide examples at the national level where the rights of the people were guaranteed or the environment was protected by purely voluntary actions and initiatives. Globalization has not changed this basic truth.

Democratically established and efficient regulations are instruments by which the will of the people can be most effectively reflected and satisfied through responsible governance and delivery of vital public services. A vigorous and responsive public sector is indispensable if development is to serve public rather than private interests.

At the global level, the absence of global regulation can put companies that want to be responsible at a competitive disadvantage. It can result in social and environmental dumping, as markets put pressure on enterprises and governments compete with one another to attract investment. Closing plants and reopening them in locations where there are no standards or only weak ones can no longer be seen as a solution. Neither can there be any moral justification for intensifying the risks in developing countries to reduce exposure in developed countries.

Poverty, employment and "just transition"

Economic growth is necessary to alleviate poverty, but it is not sufficient. In recent decades we have seen the simultaneous growth of wealth and poverty, with growing gaps inside and between countries. There need to be policy frameworks (which only government can provide) for job creation, fair taxation, decent welfare provision and other measures to get the most out of economic growth. Trade union rights are also fundamental to fair distribution of wealth. They are tried and tested tools that poor workers can use to pull themselves out of poverty, exploitation and exclusion.

In many locations we are not finding sustainable development, or indeed any form of development. Instead there is negative development, with poverty and desperation on the increase and the viability of society eroding.

For workers, even in societies that may in general be prosperous, unemployment is often a crisis for individuals, families and communities. Losing a job is more than losing an income; it most often involves a loss of self-worth, dignity, pride – regardless of the cause of the unemployment. Proposals for sustainable development that simply ask workers to sacrifice their jobs for the "greater good" are both cruel and unrealistic.

It is irresponsible to carry out economic activity that does serious damage to the environment, and irresponsible to act without considering the concerns and views of workers, their unions and their communities. When environmental costs and plant closures are considered, trade unions expect companies to look at the effect on the bottom line as well as on shareholders. Likewise they expect the views of environmental groups to be considered. What they cannot understand is lack of concern for the views of those people most affected by such changes. Integrating the social dimension of change requires "just transition".

A good example of unjust transition comes from North America. The first cars requiring unleaded gasoline were introduced around 1971. Production of tetraethyl lead ceased around 1992. The Ethyl Corporation plant at Corunna, Ontario, Canada was a major producer of tetraethyl lead. No serious effort was made to find other products for this plant, and no plans were made for the inevitable transition of plant workers. Despite having more than 20 years in which to prepare plans, knowing that tetraethyl lead was a "sun-set" product, the best governments, employers and unions were able to do for the tetraethyl lead production workers was to negotiate a severance package when the plant closed.

There is no reason to assume that either business or advocacy groups will necessarily speak for workers where change is being considered. The independent and representative voice of workers through their unions is the only proven way to ensure that the transition, if it must take place, takes into account the interests and needs of workers, i.e. that it will be "just" from their point of view.

This means serious efforts must be made to ensure that decent employment opportunities are available in the community, even if it is not possible to maintain them inside a particular enterprise. It is not enough to consider the overall employment figures in a national economy while overlooking regional differences or the impact on workers in specific industries and enterprises. The quality of employment, including wage and skill levels, is also critical to "just transition".

Just transition programmes must be more flexible and extensive than traditional labour market adjustment programmes. They must include support for communities and industries, and a period of income protection for workers – not to postpone the inevitable, but to move them from existing to emerging jobs and prepare for a new phase in their lives. The involvement of workers through their trade unions helps create an orderly and workable process and preserves institutional stability throughout the transition period.

When the Redwoods National Park in the United States was expanded by 48,000 acres in the late 1970s, timber workers faced significant job losses. A programme was worked out providing all timber workers laid off between 1977 and 1980 a guarantee of their wages, benefits and pensions for at least four years. Eligible workers also received training and relocation benefits. By 1981, $41 million had been spent on these measures (which were claimed by over 2500 workers). Although the programme could have been improved with more public planning and greater community and corporate commitment, workers and their trade unions were involved in the process and it remains a good model for just transition.

Just transition also involves environmental justice, including safe, affordable and secure access to such basic necessities of life as energy. Environmental justice and energy equity must go beyond access, however, to include all aspects of development – such as employment, culture, social costs, distribution of wealth and availability to developing nations, impacts on minority and disadvantaged groups, and intergenerational equity.

An approach that involves workers in their own futures and effectively addresses legitimate employment concerns will not only be fairer and more economically and environmentally sustainable; it will also be more politically sustainable. Democracy accelerates progress on the environment because it provides the space for unions and others to come together to push though change. But it also means that one cannot, without limit, push people around or act without the consent of the governed.

Voluntary initiatives

A global framework will develop, eventually, in which respect for property rights, already receiving some binding protection, will be balanced with effective protection of workers' rights and the environment. However, that will not be enough. Governments have an important role, but the complementary engagement of private actors is also necessary.

A positive link between a legal framework and voluntary action already exists at national level in many countries. A good example is the relationship between labour law and collective bargaining. While a good labour law ensures a basic framework, including organizing and negotiating rights, collective bargaining provides the details. Collective bargaining has a proven record of regulating the workplace in an effective, flexible and fair manner.

Voluntary initiatives may address economic, social and environmental dimensions. However, the specific manner in which these dimensions are addressed needs to take into account fundamental differences. For example, if a toxic substance threatens a tree the protection of that tree depends on human action, on protection from outside – without outside action, the tree will die. Workers, on the other hand, have the potential to protect themselves.

Unlike a tree, the crucial factor in the protection of workers is the right to organize, not monitoring by others. Only workers with unions they control have effective power to protect themselves. Outside monitoring (or various forms of verification)

of the trade union rights that give workers the capacity to defend themselves is problematic to say the least. How does one determine, in the absence of a trade union, that freedom of association is being respected? A sensitive device that can measure parts per million of a dangerous substance is much more likely to yield an accurate result than a series of questions about the right to organize addressed to a young woman worker in an export-processing zone surrounded by barbed wire.

Where fundamental workers' rights are fully respected, particularly freedom of association, the environment is also much more likely to be protected. Organized workers are able to speak and act freely in both the workplace and the community. Participation of workers and their unions in the fight for the environment is a powerful force for progress in terms of both quality of improvements and quantity of activity. In addition, freedom of association is a key element and indicator of democracy.

Democracy remains the best guarantor that environmental issues will be addressed. Purely unilateral corporate initiatives are often "nine parts public relations and one part substance". The voluntary initiatives most likely to succeed are those that rely on strengths of democracy by engaging other players, including through tripartite initiatives, non-binding instruments, and various forms of partnership and agreements.

The OECD Guidelines for Multinational Enterprises deserve special attention in this regard, as they have great potential to bring parties together and to encourage dialogue and joint action. The Guidelines cover many areas, including human rights, workers' rights, good industrial relations, corruption and the environment.

Although they are non-binding, they prescribe a role for government to ensure that they are respected wherever a company does business.

National Contact Points are established by governments adhering to the Guidelines to handle cases brought under established procedures. They are also charged with promoting the Guidelines, including with respect to internal and external investors, and can act to bring together concerned parties for dialogue.

The Global Compact and the revised OECD Guidelines both reflect a growing dialogue at the global level, including on sustainable development. They also encourage such dialogue. There is a growing social dialogue between global union federations and global companies that has led, in over a dozen cases, to framework agreements around basic, shared principles. These important voluntary initiatives arise out of relationships that allow corporate and labour leaders to resolve specific problems and to cooperate on broader issues.

The first framework agreement was signed in 1988 by the International Union of Food, Agricultural, Hotel, Restaurant, Catering, Tobacco and Allied Workers' Association (IUF) with Danone, a large French multinational in the food sector. The second, also negotiated by the IUF, was with Accor, the largest French global hotel chain in 1995. Since that time, 12 more agreements have been signed in several industries by global union federations. In a recent major restructuring of Danone's biscuit division the framework agreement, which includes a section on restructuring within the enterprise, provided the basis for a successful negotiation that, while allowing Danone to reduce its capacity, protected workers' employment opportunities.

This process is highly relevant to addressing, at a global level, the effects on workers of adjustment and could be a useful example related to sustainability. The Global Compact has been useful in some cases to stimulate a dialogue between global companies and global union federations. A number of companies are in discussions, and some of those talks will undoubtedly lead to further agreements.

Trade unions have been coming together into global union federations (formerly "international trade secretariats") by industry and occupation for over 100 years. A problem has been that there were very few counterpart organizations on the employer side – global employer federations.

There have been a few exceptions and pioneering steps. The maritime industry, for example, has long been international, giving rise to efforts to find solutions for the whole industry. There has been long-standing participation by both sides of industry in shaping the regulations that affect shipping. Social dialogue between the International Transport Workers' Federation (ITF) and ship-owners has produced the first negotiated, global, multi-employer collective bargaining agreement in history. It is a full-blown agreement covering wages and conditions, including health and safety matters, signed by the ITF in July of 2000 with the International Maritime Employers Council (IMEC) representing a number of ship owners/managers. Some other owners/managers that are not yet part of the agreement have recently expressed interest in this breakthrough global collective bargaining agreement. This is one very positive response to the long campaign by the ITF to correct abuses involving flags of convenience. Although the ITF has focused on the rights and conditions of seafarers, it is already taking leadership in the shipping industry on related issues involving flags of convenience, including the environment, global governance, massive corruption and other criminal activities.

Another exception to the exclusively company-by-company pattern is in the mining industry. A group of companies came together to examine how they could respond collectively to the growing and substantial criticism that has accompanied their activities and contribute to sustainable development. This led to a series of complementary initiatives. The representative organization at the international level of workers in that industry – the International Chemical, Energy, and Mining Federation (ICEM) – has been and continues to be involved in this process.

Improving global dialogue

UNEP's decision to actively engage in the Global Compact can boost global dialogue and cooperation involving the three partners. Most importantly, it will encourage the "mobilizing" that must occur if we are to overcome disappointment at the lack of progress since Rio and get on with preparation for the WSSD. UNEP has focused on bringing industry to the table to discuss sustainable development concerns. In recent years the worker side of industry has been increasingly represented. This helps fill a global dialogue deficit.

Trade unions and employers have the traditions and skills for dialogue, cooperation and negotiations. This gives them the capacity to reach agreements on social and environmental questions at the local, national and international levels. It is time for more companies and their industries to come together with their social partners to work hard and seriously to determine what can be done to meet our global challenges responsibly and effectively. Dialogue and negotiations are also critical in order to shape global regulation so that it is workable and effective.

To facilitate such dialogue, all partners should make their priorities for sustainable development clear. Such a process has already become part of the preparations for the WSSD by the Agenda 21 Major Groups. In this process trade unions, led by the International Confederation of Free Trade Unions (ICFTU), the Trade Union Advisory Committee to the OECD (TUAC) and the global union federations have identified a number of priorities for agreements and conventions. These are based on a list developed over the last six years of meetings at the UN Commission on Sustainable Development (CSD) and other international gatherings. Each priority is many-sided, complex, and overlaps with the others, which requires that they be examined from different perspectives depending on the issue being discussed.

The social dimension

Trade unions will be seeking agreement that the social dimension must be fully integrated, along with economic and environmental proposals, into all decision-making, with particular attention to poverty eradication and decent employment, gender and youth issues.

Core labour standards

Development that depends on violation of core labour standards, either by private concerns or by government, cannot be deemed sustainable. This principle applies to private action as well as to government behaviour. The right of workers to organize and defend their own interests is the basis of sustainability for workers, society and companies themselves. Core labour standards should be incorporated in all local, national and international planning and implementation, with special attention to standards in trade, investment and economic development, socio-economic security issues such as social and employment transition planning, and workplace assessment and verification.

Workplace programmes

As workplaces are central to production and consumption, and basic to patterns of development in the rest of society, they are a logical focus for

action on sustainable development, especially concerning the social dimension. Trade unions will be seeking agreement on workplace-based action, with attention to the connections between production and consumption, the workplace and the community. Occupational health and safety programmes provide an effective model for other programmes and a link to public health issues, such as the current HIV/AIDS pandemic.

Participatory/democratic approaches

Sustainable development requires broad-based participation in decision-making and control by the affected communities, on and off the job. Worker participation is essential in all workplace change, combined with citizen participation in community development. Focal points or "indicators" must be on inclusion of all affected groups, transparency of decision-making, and access to information at the workplace and in the community as the basis for change at all levels.

A role for government

Solutions to many of the problems related to globalization, commercialization and restructuring require an expanded rather than a reduced role for government, including local authorities. Greater attention needs to be given to capacity-building to facilitate participation and accountability. This includes a commitment to (and respect for) public service, as well as public control of such vital areas as water. There are also important sustainability aspects of many other public services, including public transit, education and health care.

Cross-cutting themes

Other cross-cutting themes need to be included whenever possible, including:

1. integration of sustainable development objectives into all policies, practices and agreements on trade and finance at the national and international level;
2. international harmonization of systems of classifying, handling and regulating toxic substances and pollutants;
3. attention to education and training and other forms of capacity-building as prerequisites to assessments, target-setting, and other aspects of workplace and community-based approaches; and
4. technology innovation and transfer that is based on the precautionary principle at the same time as it advances decent work and builds capacity. ◆

Desafíos de la Industria para la sustentabilidad

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Summary

In view of today's main environnmental and social problems, it is clear that the greatest challenge we face is making our civilization sustainable. This is not a matter of sustainable development so much as of a sustainable societal model. Industry must address environmental, social, economic and political concerns. Resource consumption needs to be reduced, as does the North-South environmental deficit; goods and services have to be distributed more equitably. It is also necessary to share economic and political power, replacing globalization with "planetarization".

Résumé

Lorsqu'on se penche sur les principaux problèmes écologiques et sociaux d'aujourd'hui, il apparaît clairement que le grand défi de l'humanité est de faire en sorte que notre civilisation soit durable. Il ne s'agit pas ici du développement durable mais d'un modèle de société durable. Pour l'industrie, les enjeux sont environnementaux, sociaux, économiques et politiques. Il s'agit de réduire la consommation des ressources naturelles, de distribuer équitablement les biens et les services, de réduire la dette écologique des pays du nord envers ceux du sud. Il faut également partager le pouvoir économique et politique et substituer à la dimension mondiale la dimension planétaire.

Resumen

Al observar los principales problemas ecológicos y sociales que padecen nuestras sociedades, se concluye que el principal desafío que afronta la humanidad, es volver sustentable nuestra civilización, no tanto lograr un desarrollo sostenible, sino una sociedad sustentable. Esto presenta a la industria desafíos a nivel ecológico, social, económico y político, como la necesidad de reducir el consumo de recursos, distribuir equitativamente bienes y servicios y reducir la deuda ecológica que tienen los países del norte con los del sur. También se ve la necesidad de distribuir el poder económico y político así como sustituir la globalización por una planetarización.

Una historia de sobrevivencia

La historia de las poblaciones ha sido la historia de los desafíos por sobrevivir. En épocas pasadas, los principales desafíos podían agruparse en 2 tipos, por un lado se tenían las amenazas provenientes de otros pueblos vecinos, como las guerras o las invasiones y por otro lado las amenazas que presentaba el medio natural como las enfermedades.

Un rasgo distintivo de estos 2 tipos de desafíos era la poca interacción entre ellos. Poco o casi nada tenían que ver las acciones de los pueblos con los problemas que a menudo se tenían con el medio ambiente. Otro rasgo importante era que los problemas de la humanidad con el medio natural, ocurrían en buena medida, por la falta de conocimiento que el ser humano tenía del funcionamiento básico de la naturaleza. Basta leer los libros de historia para conocer los apuros que pasaban muchas poblaciones para hacerle frente a las distintas epidemias o enfermedades, o para asegurar el alimento de sus miembros.

En nuestros días ambos tipos de problemas todavía persisten, se tienen a menudo relaciones entre pueblos, llenas de agresividad y violencia y cada vez son más los problemas que se presentan con el medio natural. Pero en la actualidad los rasgos distintivos de épocas pasadas, de carencia de interacciones entre estos 2 tipos de problemas y la

falta de conocimiento básico de la naturaleza ya no existen. Ahora la actuación de los pueblos, tanto en tiempos de guerra como de paz, tienen una incidencia fuerte en el medio natural y además ya se tiene un conocimiento suficiente del funcionamiento básico de la naturaleza, que nos permitiría hacerle frente a los grandes problemas que aquejan a la humanidad. Más aún, ni siquiera se podría aludir a la falta de recursos técnicos o económicos para explicar nuestro poco éxito ante los más graves problemas.

Nuestros problemas ecológicos y sociales. El desafío de la humanidad

Si observamos nuestro planeta, vemos que hay signos alarmantes de deterioro tanto ecológico como social; a veces afectando países enteros o regiones y en algunos casos a todo el planeta. Aspectos como la destrucción de los bosques, la erosión de los suelos, el incremento de niveles y extensiones de pobreza y violencia, el agotamiento del agua potable en muchas zonas, la perdida de biodiversidad y la erosión genética, la acumulación de contaminantes peligrosos en el aire y el agua, incluyendo los océanos, así como los cambios en el clima a escala planetaria y muchos problemas más, tanto locales como regionales; establecen con mucha claridad el mensaje que nuestra civilización se vuelve cada vez más insustentable. Lo más grave de esto es que los problemas no sólo son considerables en su magnitud, sino que siguen haciéndose cada vez más significativos con el tiempo.

Esta es una situación muy preocupante, ya que básicamente significa que los mecanismos que tiene nuestra civilización para el consumo y procesamiento de los recursos, la distribución de los bienes y servicios producidos y para la disposición de los desechos generados, así como toda la infra y supra estructura desarrollada para el mantenimiento de ese sistema, están generando problemas cada vez más graves y ocasionando crisis cada vez más fuertes y frecuentes, al grado que vamos en camino de un posible cuestionamiento de la existencia misma de la humanidad.

Lo más penoso y lamentable del caso, es que lo insustentable de nuestra civilización no es producto de virus, plantas o animales extraños o aspectos de la naturaleza que no podemos comprender, sino que son las mismas actuaciones del ser humano, producto de un sistema de valores incompatible con el resto de la creación, lo que está volviendo a nuestra civilización cada vez más insustentable. Como muestra de lo irracional de nuestro sistema, se puede recordar aquel cálculo que muestra que si todos los habitantes del planeta alcanzaran el nivel de consumo del habitante promedio de EEUU, habría que extraer recursos de 6 planetas más del tamaño de la tierra, a pesar que EUU dista mucho de ser una sociedad modelo. En esto radica el principal desafío de la humanidad, en volver sustentable a nuestra civilización.

Desarrollo sostenible o sociedad sustentable

La mayoría de gobiernos del mundo, al menos en sus declaraciones públicas, reconocen los graves problemas ecológicos y sociales que padece la humanidad. Inclusive algunos de sus dirigente podrían hasta estar convencidos que nuestra sociedad no es sustentable. Al menos así lo sugiere la próxima cumbre mundial sobre el desarrollo sostenible, que organizan las Naciones Unidas en Johannesburgo el próximo mes de septiembre del 2002, donde los Jefes de Estado de los diferentes países del mundo se darán cita para discutir una serie de aspectos relacionados con dicha problemática.

Aquí pareciera que no se ha planteado bien el problema, ya que se da por sentado que lo que necesitamos es un desarrollo que sea sostenible, cuando lo primero que deberíamos discutir es qué es lo que queremos volver sostenible. Lo que importa en última instancia son nuestras comunidades, nuestros países, nuestras regiones, nuestro planeta y eso es lo que deberíamos tratar de volver sostenible: A nuestras sociedades. El desarrollo hay que verlo como un instrumento que debe estar al servicio de nuestras sociedades. Comparar el desarrollo con la sociedad es como comparar un motor con el barco. Lo que importa en última instancia es que el barco sea sostenible, que no se hunda. Claro que el motor es importante para llevar el barco a diversos lugares, pero pueden haber situaciones, como la presencia de un gran témpano de hielo en el camino, que exige que ese motor haya que detenerlo, e inclusive hacerlo retroceder, en aras de la sostenibilidad del barco.

En ese marco de análisis hay que concebir al desarrollo en función de la sociedad. El desarrollo es necesario. Sin embargo, dada la magnitud de los problemas que se vislumbran en el futuro cercano, como los ocasionados por el cambio climático, producto del propio desarrollo, habría que analizar la conveniencia de detener ese desarrollo o al menos ajustarlo o modificarlo en algunos países y quizás impulsarlo con mayor insistencia en otros, de acuerdo a las condiciones específicas de cada país o región. Todavía hay otro aspecto que es necesario discutir, ¿queremos volver a nuestras sociedades sostenibles o sustentables? Sostenible viene de sostener y sustentable de sustentar. Las cosas se sostienen desde afuera y se sustentan desde adentro, o sea que el concepto de sustentabilidad lleva implícito la idea de acciones tomadas desde adentro, en forma más o menos autónoma. Por lo tanto el objetivo debe ser: La sustentabilidad de la sociedad. Quizás el tema de la próxima reunión debería haber sido Cumbre Mundial para la Sociedad Sustentable.

El rol de la industria en la sustentabilidad

Los desafíos ecológicos

La industria, como consumidora de recursos y productora de bienes y servicios, ha jugado un papel decisivo en la conformación de nuestra civilización y por lo tanto en su insustentabilidad. Esto significa que la industria tiene también una cuota importante de responsabilidad, en contribuir a conducir a nuestras sociedades por el camino de la sustentabilidad, lo que significa entre otras cosas, revertir todos esos procesos de deterioro social y ecológico que afectan a nuestra civilización.

Los desafíos concretos que se le presentan a la industria para contribuir a alcanzar este objetivo de volver sustentable a nuestra civilización, son muchos y dependen por supuesto del tipo de industria. Sin embargo, en términos generales, se podría decir que uno de los desafíos más importantes y evidentes que tiene la industria es reducir el consumo de recursos, sobre todo los no renovables. Esto también ocasionará por supuesto, una reducción en la generación y toxicidad de los desechos. En términos ecológicos nuestro planeta consume un 50% más de los recursos que debería consumir; lo mismo sucede con la generación de desechos. Esto significa que la industria como un todo, debe reducir alrededor de una tercera parte el consumo de recursos, lo que significa poner mucho esfuerzo en el desarrollo de tecnologías y procesos más eficientes. Así mismo, la toxicidad de algunos desechos generados en la actualidad, exige la adopción de nuevos recursos, tecnologías y sistemas.

Siempre en el nivel ecológico, la industria tampoco puede abstraerse de los otros problemas que se presentan en el camino hacia la sustentabilidad. Por ejemplo, ya no se puede seguir destruyendo los bosques primarios o erosionando la biodiversidad del planeta, ya que esto está debilitando la red de la vida en forma irreversible. Tampoco se puede seguir incrementando los gases de efecto de invernadero que están poniendo en peligro la estabilidad de la atmósfera, o arrojando gases cuyos efectos secundarios en los seres vivos se desconocen, o creando organismos vivos que en 4,500 millones de años, la naturaleza no se atrevió a crear. La industria debe reconocer que hay límites biológicos al impacto que se podría generar y estos, en aras del futuro de la humanidad, no pueden ser sobrepasados.

Los desafíos sociales

La sustentabilidad, además de los aspectos ecológicos también tiene aspectos sociales. Una cosa es tratar de reducir el consumo de recursos a escala planetaria por razones puramente ecológicas y otra distinta es garantizar que todos los seres humanos tengan lo necesario para llevar una vida digna. Lo irónico del caso es que a pesar que como raza humana consumimos un 50% más de los recursos que deberíamos consumir, la mitad de la humanidad no consume ni siquiera lo necesario para vivir como organismo biológico sano, mucho menos para vivir como ser humano digno. Aquí la industria también tiene una buena oportunidad para contribuir. Acaso no podría la industria, por ejemplo, diseñar mecanismos y sistemas para suministrar energía en forma barata, descentralizada y con recursos renovables. ¿No valdría la pena poner esfuerzo en el desarrollo de mecanismos de transporte como bicicletas o vehículos solares, con impacto mínimo en el ambiente y a precios asequibles a la mayoría de la humanidad? ¿Y el caso de las medicinas? ¿No se podría tratar de erradicar el flagelo que sufren millones de personas enfermas, simplemente produciendo medicinas a costo considerablemente menor? Abundan los ejemplos donde un medicamento de marca, comparado con el mismo medicamento genérico, tiene un

precio de venta hasta 10 veces más caro.

La responsabilidad que tiene la industria en contribuir a solucionar los problemas sociales, se deriva del hecho que la industria ha tenido una participación considerable en la generación de estos mismos problemas. Tomemos como ejemplo el caso del cambio climático. Este problema ha alcanzado una escala planetaria y es el resultado del éxito técnico y económico de industrias como la del petróleo y los vehículos motorizados. Se ha extraído del subsuelo y consumido tanto petróleo que las emisiones de dióxido de carbono han incrementado la temperatura de la atmósfera a grado tal, que se ha generado un cambio en el clima del mundo generando, entre otras cosas, comportamientos extremos como huracanes y sequías, cada vez más fuertes y más frecuentes, ocasionando pérdidas económicas y humanas, también cada vez más fuertes y más frecuentes.

La injusticia ambiental. La deuda ecológica

Con el problema del cambio climático, como en muchos otros, se evidencia un hecho de injusticia ambiental. Unos sectores consumen petróleo y por lo tanto generan desechos, ya sea mediante el uso de vehículos de transporte o el consumo de bienes que para su producción utilizan petróleo; sin embargo, los sectores que sufren las consecuencias del cambio climático son otros. Cuando se habla de sectores consumidores de recursos, se habla mayormente de sectores de población ubicados en el hemisferio norte, como EEUU, Europa y Japón. Cuando se habla de sectores que sufren las consecuencias de ese consumo, se habla de sectores de población mayormente ubicados en el hemisferio sur, como ha sucedido con las inundaciones en Bangladesh, Mozambique, Kenia, India o Venezuela o con huracanes como el Mitch en América Central. En este marco de análisis se puede hablar de una deuda ecológica que tienen los países del norte con los países del sur.

Esta deuda ecológica no se genera únicamente por el consumo de petróleo sino que se extiende a todos aquellos recursos donde su extracción, uso y distribución, hayan estados inmersos en una situación de injusticia ambiental. Además, esta deuda no solo se da entre países, sino también dentro de cada país entre los sectores más consumidores y aquellos que consumen poco o casi nada. La deuda ecológica también se genera entre sectores con diferentes estilos de vida o modelos de desarrollo. Por ejemplo, las ciudades tienen una fuerte deuda ecológica con las zonas rurales, ya que el desarrollo de las urbes, casi siempre ha tenido como contraparte el deterioro del campo.

Hablar de deuda ecológica es hablar de injusticia ambiental, donde haya habido injusticia se ha generado deuda. En este sentido se puede hablar también de una deuda ecológica histórica del hombre con la mujer, del hombre blanco con las gentes de color y los pueblos indígenas, de esta generación y las generaciones pasadas con las futuras generaciones. También hay que reconocer la existencia de una deuda ecológica del Homo Sapiens con el resto de la creación.

Otra oportunidad de aporte para la industria es desarrollar tecnologías y procesos que tiendan a reducir esta deuda ecológica y eventualmente hacerla desaparecer. Por ejemplo, cada vez que se extraen combustibles fósiles o se utiliza tecnología que lo consume, se está contribuyendo a la generación de esa deuda. Lo mismo se puede decir cuando uno observa que la sola producción de un anillo de oro ha requerido en promedio, la generación de 12 toneladas de desechos que en alguna parte del mundo están ocasionando un problema ambiental. El mismo planteamiento podría hacerse de las grandes presas hidroeléctricas, que para suministrar electricidad a las ciudades o a la industria productora de bienes y servicios, inunda grandes extensiones de terreno, afectando considerablemente la vida de muchas personas y los ecosistemas. Al analizar estas situaciones vemos como casi siempre en nombre del desarrollo se han promovido situaciones donde se privatizan los beneficios pero se socializan los costos.

Una mera transición a otras fuentes de energía renovables, descentralizadas y en pequeña escala, o un uso más sabio de los metales podría contribuir a reducir esa deuda ecológica. La industria generalmente tiene en cuenta conceptos como ecoeficiencia, donde lo central es hacer un uso más eficiente de los recursos con miras a no dañar el ambiente. Sin embargo, es conveniente también hablar de aspectos como la ecosuficiencia, donde se debe aceptar que existe un límite natural al consumo de los mismos.

La deuda ecológica ha contribuido al deterioro de diversos sectores sociales que se han visto afectados en aspectos como la salud, la nutrición, la vivienda o la educación. De nuevo se presenta otra oportunidad a la industria para contribuir a la sustentabilidad. ¿No podría la industria contribuir al suministro de bienes y servicios como viviendas, medicinas o alimentos que estuvieran más al alcance de los sectores de escasos ingresos? ¿Acaso no debería ser un eje transversal en toda la industria contribuir a mejorar las condiciones de vida de los sectores de escasos recursos económicos? En resumen, la industria también tiene la responsabilidad de contribuir a promover un intercambio equitativo de recursos entre los diferentes sectores sociales y fomentar la distribución de la riqueza.

En este nivel social de la sustentabilidad, la industria también podría cooperar en el desarrollo de tecnologías y producción de bienes y servicios que contribuyan a generar en la población, la adopción de valores que generen comportamientos armónicos con la naturaleza y entre los seres humanos. También es importante que en todas las etapas de los diferentes procesos industriales se consideren los aspectos genéricos, buscando siempre promover una situación de equidad entre el hombre y la mujer.

Los desafíos económicos

La sustentabilidad también tiene una serie de requerimientos de índole económica, con los cuales la industria también podría contribuir mediante el diseño de sus procesos y producción de bienes y servicios. Algunos ejemplos podrían ser, tratar de reducir la dependencia de los países y regiones, descentralizar y diversificar la capacidad productiva, fortalecer la actividad económica (producción y consumo) local y regional equilibrada, etc.

En el presente la industria está en su mayoría comprometida con la globalización económica, lo cual va en contra de muchas tendencias necesarias para la sustentabilidad. Como contraposición a esta globalización, se propone la planetarización, la cual adopta los beneficios que pudiera presentar la globalización, como es ver al mundo como un todo, pero rechaza el concepto de uniformidad que se presenta en el concepto de globalización. La planetarización en su integralidad y visión holística, reconoce las diferencias entre sectores y regiones como pueden ser la cultura, historia, religiones o situaciones sociales, económicas o políticas. También en el ámbito económico es importante reflexionar que no podemos ir en el camino de la sustentabilidad si seguimos aceptando la mercantilización de la vida.

Los desafíos políticos

La sustentabilidad también tiene un dimensión política, en la cual también la industria tiene un rol que jugar con sus actividades. Quizás el aspecto más importante que la industria debería tratar de potenciar es la distribución del poder económico y político entre los diferentes países y regiones. Esto indudablemente contribuiría a tener un mundo más democrático y solidario y por supuesto más fácil de mover hacia un desarrollo sustentable.

La sustentabilidad también requiere una serie de condiciones que bien haría la industria en tratar de lograr, o contribuir a que se logren en sus acciones. Por ejemplo, toda actividad industrial debería regirse en la medida de lo posible por el criterio de mínima perturbación de la naturaleza, ya que casi siempre el impacto sobre los seres vivos es irreversible y a menudo es de magnitud insospechada. Otro aspecto que toca directamente a la industria en sus procesos es el del transporte. En esto un criterio podría ser reducir al mínimo las distancias entre la localización y el procesamiento de los recursos y la distribución de los bienes, así como entre la generación y el procesamiento de los desechos.

Lo que debe de entenderse de la sustentabilidad es que es en el interés de todos y por lo tanto todos debemos tener el interés y deber de contribuir a conducir a nuestras sociedades por ese camino. De lo contrario, si se continúa con una civilización cada vez más insustentable, se incrementan los niveles de crisis y violencia en todos sus géneros. En algunos sectores de alto poder económico existe la impresión que, con el suministro de recursos económicos o el desarrollo de tecnologías, siempre habrá forma de hacer frente a cualquier crisis. Pero si las crisis continúan agudizándose, a nuestra civilización puede llegar a sucederle lo que pasa cuando se accidenta un jumbo jet, que en realidad no importa quienes iban en primera clase. ◆

Cycle de vie des produits et environnement : de l'écologie industrielle à l'écologie familiale

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Summary
Higher living standards, combined with demographic changes, mean increased demand for goods and services. Problems with the functioning of ecosystems are linked to ever-growing resource use, habitat modification and accumulation of waste hazardous to biotic communities, including human ones. Solutions aimed at reducing environmental risk depend on a better understanding of the underlying socio-ecological mechanisms, and on deployment of effective tools and methods for evaluation and intervention. "Household ecology", as a complement to environmental management in enterprises, can provide several types of information useful in decision making.

Résumé
L'amélioration de la qualité de vie, associée aux modifications démographiques, se traduit par une demande de biens et de services grandissante. Les causes de dysfonctionnement des écosystèmes sont liées aux prélèvements toujours plus importants de matières premières, à la modification des niches écologiques et aux rejets accrus de produits préjudiciables aux biocénoses, Homme y compris. Les solutions visant à réduire les risques environnementaux reposent sur une meilleure compréhension des mécanismes socioécologiques sous-jacents et sur la mise à disposition d'outils et de méthodes d'évaluation et d'intervention efficaces. En complémentarité avec les démarches de management environnemental au sein des entreprises, l'écologie familiale peut apporter un ensemble d'éléments pertinents d'aide à la décision.

Resumen
La mejora de la calidad de vida, asociada a las modificaciones demográficas se traduce en una demanda creciente de bienes y servicios. Las causas del mal funcionamiento de los ecosistemas están relacionadas con el uso creciente de recursos, la alteración de ambientes naturales y la acumulación de residuos perjudiciales para las biocenosis, incluyendo las humanas. Las soluciones que apuntan a reducir los riesgos ambientales se basan en un mayor conocimiento de los mecanismos socio ecológicos subyacentes y la disponibilidad de herramientas y métodos de evaluación e intervención efectivos. Complementariamente con la gestión ambiental corporativa, el concepto de "ecología familiar" puede aportar información de utilidad para la toma de decisiones.

Introduction

La plupart des causes de modifications environnementales sont la résultante de phénomènes naturels et anthropiques intervenant simultanément sur les cycles biogéochimiques des éléments. Du fait de ses activités, l'homme, espèce parmi d'autres au sein de la biosphère, interagit avec les écosystèmes par l'intermédiaire de ses environnements de proximité. Il s'inscrit inéluctablement dans le cycle de la matière et de l'énergie, en prélevant, transformant, rejetant.

La dégradation croissante des milieux aquatiques, terrestres ou atmosphériques, représente une menace majeure pour l'évolution de l'espèce humaine et, plus largement, pour les différentes biocénoses. Face à la plus grande prise de conscience des problèmes environnementaux, les acteurs socioéconomiques mettent en place et développent des stratégies visant à mieux prendre en compte ces menaces. Toutefois, les difficultés pour cerner les relations entre les activités humaines et les incidences écologiques sont très importantes : superposition de causes, effets différés, méthodes et outils d'évaluation insuffisants, coûts prohibitifs, pour n'en citer que quelques-unes.

Parmi les méthodes d'investigation envisageables, l'analyse de l'impact des produits tout au long de leur cycle de vie (ACV) permet de cerner plus précisément la nature et l'amplitude des modifications exercées sur les écosystèmes. Quelles que soient les étapes parcourues du « berceau à la tombe », en terme d'objectif, la cible du produit final est toujours la population, ce qui justifie d'accorder une attention particulière à cette partie du cycle de vie des produits domestiques. De plus, il est impératif de mieux appréhender les comportements des consommateurs qui peuvent moduler de façon considérable le devenir des produits lors de leur utilisation.

L'objectif de cet article est de montrer la forte complémentarité entre l'écologie industrielle et l'écologie familiale, en resituant la contribution des ménages aux modifications environnementales par rapport à l'ensemble du système socioéconomique, plus particulièrement, vis à vis des interactions « entreprises – consommateurs ». Cette nécessaire complémentarité ne pourra s'opérer effectivement qu'après avoir effectué les recherches nécessaires à une meilleure compréhension de la problématique « production, distribution, consommation et environnement ».

Du management environnemental des entreprises à l'écologie industrielle

La volonté d'améliorer les conditions de production et de se maintenir sur le marché incitent les entreprises à se doter d'un « système de management environnemental (SME) » basé sur la prise en compte des conséquences environnementales de leurs activités[1]. Au sein des entreprises, le concept de management de l'environnement est souvent associé aux démarches antérieures de qualité (norme ISO 9000) et de sécurité, rejoignant ainsi le « management par la qualité totale »[2]. Au travers de cette démarche volontaire, les entrepises recherchent différents avantages : diminution des coûts de production (matières premières, énergie, eau, taxes, pénalités…), accroissement des ventes (image de marque interne et externe), contrôle des fournisseurs et des prestataires de service, prévention à l'égard des accidents écologiques, amélioration de la qualité et de la sécurité, garanties à l'égard des assurances, des actionnaires, des banques, faire-valoir lors de fusions, de ventes ou d'acquisitions d'entreprises, soutien des pouvoirs publics... Une des démarches de visibilité interne et externe des performances des SME est l'obtention de labels et de certifications. La certification ISO 14001 et le règlement européen Eco-audit représentent des arguments positifs au regard des divers partenaires. Toutefois, le nombre de structures qui sont engagées dans ces démarches est encore très réduit, notamment dans le secteur tertiaire et dans l'agriculture (en novembre 1999, la France comptait moins de 500 entreprises dont le SME était reconnu conforme à la norme ISO 14001).

Certaines grandes industries, du fait des lourdes conséquences écologiques antérieures liées à leurs activités (chimie, pétrochimie, métallurgie…), ont été les premières à s'investir dans cette voie ; elles entraînent dans leur sillon les sous-traitants et les concurrents. Les entreprises les plus perfor-

mantes à cet égard disposent actuellement de moyens d'investigation des choix stratégiques considérables vis-à-vis des priorités environnementales, et participent activement aux décisions en matière de réglementation, de certification, d'orientations scientifiques et technologiques. Bien que la responsabilité environnementale des PME-PMI ne soit pas négligeable, du fait de leur nombre élevé (2,3 millions d'entreprises de moins de 10 salariés, dont 1,15 millions sans salarié) et de leur large répartition sur l'ensemble du territoire français, peu d'entre elles se sont mobilisées. Toutefois, une évolution positive de leur effort écologique est envisageable à court terme, du fait de leur dépendance à l'égard des grosses entreprises ou de leur propre initiative.

Les difficultés de mise en place de démarches environnementales sont fonction notamment de la taille, du secteur d'activité, du potentiel d'expansion, du niveau technologique, de la politique interne des entreprises. Il y a encore beaucoup d'abus, de négligences ou d'impossibilités techniques et financières pour atteindre les objectifs espérés en matière de prévention des risques écologiques. Ceci est lié à plusieurs causes : les contraintes déjà très lourdes découlant de la prise en compte récente de l'environnement, l'accroissement rapide des coûts associés à un niveau d'exigence supérieur, la concurrence nationale et internationale dans le cadre de contraintes réglementaires différentes selon les pays et les secteurs d'activité, la culture d'entreprise, etc.

Sous l'influence des pressions sociales, de l'encadrement réglementaire, des directives européennes et de la volonté des dirigeants d'entreprises, des avancées significatives devraient se produire au cours des prochaines années. Cependant, le management environnemental au sein des entreprises, qui représente un progrès certain et prometteur, ne peut être considéré comme suffisant ; les objectifs sont avant tout économiques et reposent sur des indicateurs environnementaux souvent insuffisants pour apprécier les impacts écologiques (DCO, équivalent CO_2, concentrations...). Les fondements écosystémiques sont encore peu considérés : diversité spécifique, dynamique des populations animales et végétales, génétique des populations, écotoxicologie... De plus, ces initiatives d'amélioration continue de la prise en compte de l'environnement font référence à un état initial qui n'est pas toujours exemplaire. Les tendances à la diminution de certains rejets et prélèvements néfastes pour les écosystèmes ne doivent pas faire oublier qu'il y a toujours rejets ou prélèvements, qu'ils se situent dans le prolongement d'un passif en matière de pollution souvent lourd pour nombre d'activités industrielles, dont les conséquences sur les biotopes et les biocénoses sont toujours effectives et qu'elles peuvent se répercuter à très long terme (productivité, biodiversité, résilience, résistance, etc.).

L'écologie industrielle, que l'on pourrait définir comme l'étude des relations entre les activités industrielles (ou entrepreneuriales) et les écosystèmes, devrait apporter une dimension supérieure à la réflexion et aux décisions prises en matière d'environnement industriel. En effet, les actions actuelles reposent sur la réalisation d'audits d'environnement visant essentiellement à dresser un bilan des entrants et des sortants du système considéré, en terme de quantité de matières premières, d'énergie, d'effluents… et à tenter d'apprécier à partir de ces informations, le plus souvent en référence à des normes ou des données empiriques plus ou moins bien fondées, les risques environnementaux. Ces audits concernent généralement des sites et, pour une faible minorité d'entre eux, des produits (label « écoproduit » par exemple). Pour accroître l'efficacité du management environnemental, il serait urgent d'accroître, en amont des procédures d'application en vigueur, les connaissances écologiques fondamentales, dans le cadre de démarches industrielles finalisées, déterminantes pour la gestion raisonnée des écosystèmes ainsi que pour la santé humaine.

La séquence production, distribution et consommation des produits étant une cause essentielle de la modification de nos environnements, une analyse approfondie de ses fondements représente un support cognitif et informatif précieux. Pour ce faire, l'étude de l'impact des produits – biens et services – sur les milieux et les biocénoses doit porter sur les activités des entreprises mais également sur les comportements des usagers. La conduite des ACV, préconisée dans le cadre de la norme ISO14040 notamment, traduit clairement les difficultés et les limites de ces approches[3]. En l'état actuel des connaissances et des demandes, plus particulièrement suite à l'« écobilan » (inventaire, constat), la partie « impacts avérés » sur les écosystèmes est particulièrement hypothétique et spéculative. C'est dans ce courant de pensée et d'action qu'il nous paraît important de reconsidérer, dans le cadre de recherches fondamentales et appliquées, la contribution des activités humaines à l'évolution des milieux et des biocénoses, Homme y compris. L'ACV des produits représente un fil conducteur pertinent entre activités entrepreneuriales et activités domestiques, renforçant ainsi l'idée de déve-

Figure 1
Complémentarité de l'écologie industrielle et de l'écologie familiale pour l'étude des relations entre le cycle de vie des produits domestiques, les environnements de proximité et les écosystèmes

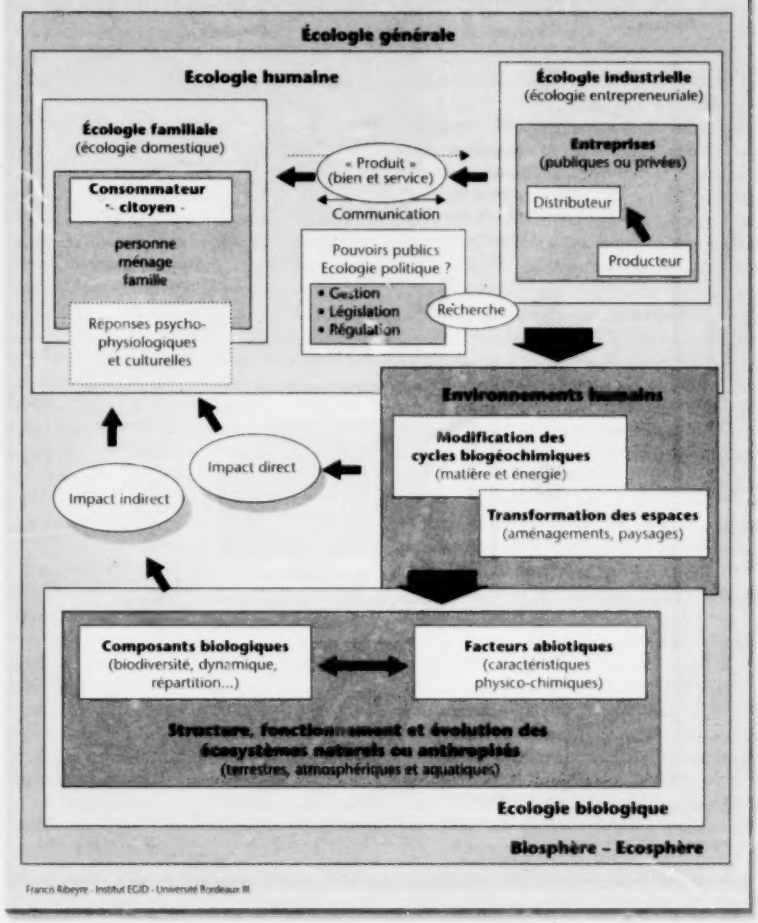
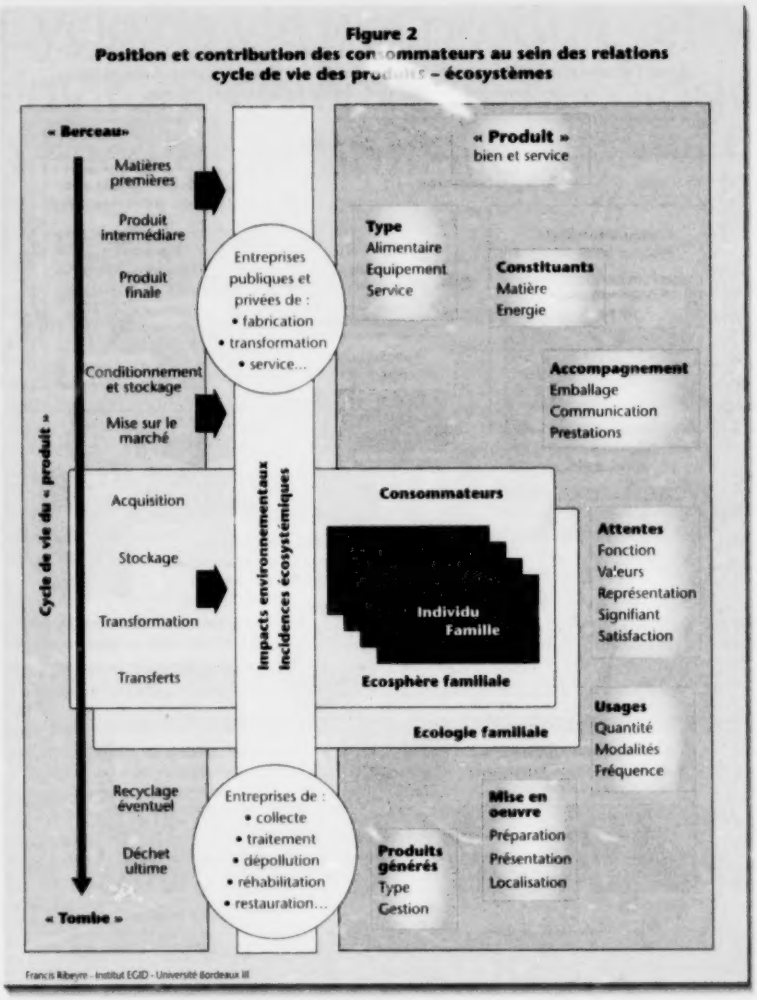


Figure 2
Position et contribution des consommateurs au sein des relations cycle de vie des produits – écosystèmes



lopper conjointement l'écologie industrielle et l'écologie familiale, deux champs disciplinaires majeurs de l'écologie humaine (**figure 1**).

Suite aux nombreuses investigations bibliographiques portant sur divers aspects du champ d'étude – écologiques, sociologiques, économiques … –, il apparaît que nos connaissances de l'incidence des activités familiales sur les évolutions écosystémiques sont très nettement plus sommaires que nos connaissances en écologie biologique (écologie végétale ou animale), voire même en écologie industrielle. Ce constat justifie donc de consacrer tout d'abord des efforts à l'écologie familiale.

Apports de l'écologie familiale

« L'écologie familiale vise à étudier les relations entre l'homme et ses environnements de proximité, associées aux activités domestiques se déroulant dans l'écosphère familiale, et à les resituer par rapport aux interrogations et aux interventions à l'égard du devenir des écosystèmes »[4]. L'écosphère familiale est caractérisée par un microcosme hautement anthropisé constitué d'une biocénose diversifiée dans laquelle l'homme occupe une place prépondérante, et d'un biotope étroitement associé à l'habitat et aux équipements, soumis à des flux de matière et d'énergie dont une partie est étroitement sous le contrôle du système « production – consommation ».

Bien que les entreprises aient une contribution très importante à l'égard de la modification des écosystèmes, l'incidence de la consommation des ménages est directement appréciable au travers de l'habitat et des aménagements connexes, des rejets atmosphériques, en relation avec le chauffage des habitations ou l'utilisation de l'automobile notamment. Les problèmes de pollution au sein même des habitations se posent de plus en plus vivement du fait de l'isolement renforcé des locaux, de la présence de produits toxiques dans divers matériaux ou équipements, de l'omniprésence de champs électriques, ou encore de sources de radon. L'habitacle des véhicules représente également un micro écosystème très particulier. Les nombreuses sources de pollutions et de nuisances associées au mode de vie des citoyens modulent fortement leurs environnements de proximité, mais aussi, via les interfaces et les vecteurs de transports atmosphériques, aquatiques…, la plupart des écosystèmes. Les consommateurs sont responsables des désagréments qui en découlent, à la fois directement et indirectement, via les entreprises qu'ils sollicitent pour leur fournir les produits qu'ils utilisent.

Une meilleure appréhension de l'impact des activités domestiques sur les écosystèmes et des risques pour la santé repose sur une analyse approfondie du devenir des produits au sein de l'écosphère familiale, en relation avec leurs processus d'acquisition, leurs modes de stockage et de transformation, les échanges entre le milieu intérieur et le milieu extérieur (**figure 2**). Par rapport à l'ACV, l'activité familiale se trouve en position intermédiaire entre deux types d'activités entrepreneuriales : en amont, la production et la distribution des produits ; et en aval, le recyclage, le retraitement des déchets. Comme en écologie industrielle, l'ACV repose sur un bilan des entrants et des sortants, suivi d'une analyse des incidences sur les milieux, la faune et la flore, sans oublier les populations humaines.

L'évolution de la consommation des ménages est étroitement associée à celle de la société en général. La demande de biens et de services est soumise à des changements importants liés à des aspects démographiques – effectifs, vieillissement … –, sociaux – structures familiales, travail, loisirs … –, technologiques – équipements, communications -, éthiques – limitations, précautions…, qui se répercutent inévitablement sur les écosystèmes[5]. Comment prendre en compte ces déterminants socioéconomiques dans les ACV si l'on veut rendre compte de la diversité des comportements des consommateurs vis à vis des produits, et des profondes mutations sociétales actuelles et envisageables à moyen terme ?

Tout d'abord il apparaît nécessaire de mieux comprendre les microécosystèmes familiaux afin de mieux cerner la variabilité des réponses, de dégager éventuellement des invariants, de définir des écotypes. Cet objectif ne peut être atteint qu'après avoir conçu et mis en œuvre des méthodologies adaptées. Il s'agit avant tout d'un travail de recherche, dont les résultats permettront de proposer des informations et des outils d'évaluation facilitant l'appréciation des impacts écologiques associés à l'utilisation des produits domestiques notamment.

Les difficultés d'une telle approche, centrée sur la partie du cycle de vie correspondant à la consommation des ménages, sont liées à la complexité des mécanismes impliqués –diversité et signifiant des produits, variabilité des comportements des personnes, grand nombre de ménages, etc.– et aux limites des moyens d'observation envisageables – enquêtes, instrumentation, indicateurs économiques, expérimentations.

A titre d'illustration de la démarche de recherche proposée, une confrontation méthodologique a été effectuée dans le cadre d'une application pédagogique auprès d'étudiants de DESS (troisième cycle universitaire français), dans le cadre d'un module consacré aux audits d'environnement. Face à la

diversité des exemples envisageables, le choix des produits n'est pas évident. Les critères de décision sont divers : produits communs à la plupart des personnes ; caractéristiques relativement bien connues ; intérêt écologique ; liens économiques et comportementaux ; diversité des problèmes posés ; disponibilité de données scientifiques ; utilisation fréquente ; biens fongibles ou durables ; complexification méthodologique ; dimensions socioéconomiques ; uniformité d'usage. De plus, plutôt que de retenir trois ou quatre produits indépendants, il paraît intéressant de prendre ceux qui sont très différents et qui présentent de fortes complémentarités, afin d'apprécier leurs interrelations, voire interactions, à l'égard de l'environnement. C'est dans cet esprit qu'a été retenu en première approche le service « lavage du linge en machine ». Situé après les besoins humains fondamentaux comme se nourrir, s'abriter, se protéger, se reproduire, l'entretien du linge, plus particulièrement des vêtements, apparemment anodin, renvoie cependant à diverses finalités qui ont une grande importance : se protéger du regard des autres, supporter les aléas climatiques, communiquer sur soi, se prémunir des maladies, se sentir bien. Il s'agit d'une activité domestique banale, connue, voire pratiquée par un très grand nombre de personnes, jeunes ou âgées, hommes ou femmes (bien que dans 95 % des ménages cette tâche était effectuée encore très récemment par les femmes ; 90 % des ménages disposent d'une machine à laver le linge, ce qui fait environ 20 millions de lave-linge en France). Les produits impliqués – eau, détergents, énergie et machine à laver – présentent une forte complémentarité d'utilisation et peuvent être considérés de ce point de vue comme constituant une « unité fonctionnelle ». Malgré son apparente simplicité, cet exemple permet d'aborder de nombreux aspects conceptuels et méthodologiques. Le travail de réflexion, d'information, de conceptualisation et de confrontation commence par une approche qualitative et se poursuit par une analyse semi-quantitative.

L'approche qualitative vise à analyser le système étudié afin d'en révéler la structure et d'en dégager les composantes majeures. L'identification structurelle et fonctionnelle repose sur la délimitation préalable du système étudié. Dans l'état des connaissances et des savoir-faire actuels, il est impératif d'isoler, momentanément du moins, une partie de ces hyper systèmes pour tenter d'en cerner quelques mécanismes. La définition des contours de l'unité fonctionnelle à analyser n'est pas évidente ; elle dépend étroitement des objectifs de l'étude, du niveau de précision que l'on souhaite atteindre, des données disponibles, des applications envisagées … Toutefois il paraît important de resituer cet objet par rapport aux autres éléments du système, notamment par l'intermédiaire des interfaces, puis éventuellement des ramifications au sein du sous-système dont il est extrait. Cette première opération impose une certaine clarification de l'image que l'on a de l'objet retenu, d'autant plus aisée que celui ci est familier. C'est en ce sens que l'analyse de la partie du cycle de vie de produits domestiques présente de grandes potentialités pédagogiques ; chaque étudiant ou stagiaire a une représentation mentale, plus ou moins élaborée certes, des objets situés dans son environnement domestique.

Une confrontation quantitative à petite échelle est ensuite réalisée en conditions très simplifiées, à partir d'un cas de figure semi-virtuel (qui pourrait être réel). Une première phase consiste à établir un bilan des entrées et des sorties du sous-système identifié ; la seconde porte sur les impacts écologiques des flux de matière et d'énergie sur les environnements de proximité et, plus largement, sur les écosystèmes. Sans avoir la prétention de représenter fidèlement la réalité de l'ensemble des aspects évoqués lors de l'étape qualitative, le but de cette approche est de permettre aux étudiants d'aborder de façon formelle les diverses disciplines rassemblées autour de l'unité fonctionnelle retenue : démographie, sociologie, économie, écologie, écotoxicologie …

Conclusion et perspectives

Combiner la logique du développement humain avec une gestion raisonnée des milieux et des biocénoses nécessite de disposer d'informations pertinentes sur les interactions entre les activités humaines et l'environnement. L'analyse de l'incidence des produits sur les écosystèmes et la santé humaine représente une voie de réponse aux problèmes posés mais se heurte à la complexité du champ d'étude. Le développement concomitant de l'écologie industrielle et de l'écologie familiale devrait conduire à une meilleure compréhension et à une formulation plus explicite des mécanismes impliqués, ainsi qu'à la proposition d outils de diagnostic et de prévention plus performants que ceux qui sont actuellement utilisés. Les avancées cognitives et méthodologiques qui peuvent découler d'approches pluridisciplinaires centrées sur les interactions entre le cycle de vie des produits et les écosystèmes représentent sans nul doute des atouts supplémentaires pour faire face aux risques technologiques et naturels qui menacent les populations humaines.

Notes

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World News

For more information, contact: IE Public Information Office, 9 rue de l Fédération, 75739 Paris Cedex 15, France Tel: +33 1 40 57 65 50, Fax: +33 1 40 57 65 59 E-mail: fiona.davies@iea.org, Internet: www.iea org.

OECD ministers discuss sustainable development

At its annual meeting at ministerial level in Paris, the OECD Council addressed the theme "Partnership for Growth and Development". The Council supported the Monterrey Consensus (see page 40) and the Doha Development Agenda. It indicated that it looked to the World Summit on Sustainable Development as a further opportunity to build partnerships between developing and developed countries.

Representatives of key non-OECD economies took part in the May meeting, including ministers from the Steering Committee of the New Partnership for Africa's Development. Forum 2002, held in conjunction with the ministerial meeting, allowed leaders from civil society, business and labour to discuss policy issues with ministers and leaders of international organizations.

Agreeing that one of the greatest challenges of the 21st century would be "how to improve substantially the quality of life in the poorer regions of the world and to ensure that development in all countries is sustainable," the ministers pledged to "continue to undertake structural reforms, thereby creating an environment in which economic efficiency, higher levels of employment, and improved living standards are more likely to be realized."

The ministers also agreed to emphasize policies that would reduce trade-distorting and environmentally harmful subsidies. Moreover, freer trade and investment could be carried out so as to minimize the social costs of adjustment, support environmental protection and preserve governments' rights to regulate.

The ministers stated that all countries should play an active role in ensuring the success of the WSSD. They committed to intensification of the implementation of Agenda 21. The importance of active involvement by the private sector and civil society was stressed.

For more information, contact: Richard Hecklinger, Deputy Secretary-General, Organisation for Economic Co-operation and Development, 2 rue André-Pascal, 75775 Paris Cedex 16, France, Internet: www.oecd.org. ◆

IEA says energy prospects are unsustainable

The International Energy Agency estimates that world energy demand (especially demand for fossil fuels) will increase by 57% between 1997 and 2022, creating enormous pressure on the global environment.

According to *Toward Solutions: Sustainable Development in the Energy Sector*, huge investment needs, continued distortions in the energy market and growing problems related to seemingly insatiable demand for transport – combined with barriers to use of renewable energy sources – indicate that countries need to improve their efforts in this area.

"We are not on a sustainable energy path unless we make considerable changes," Robert Priddle, Executive Director of the OECD-affiliated agency, said in presenting the IEA report, which is a contribution to the World Summit on Sustainable Development. Energy will be one of the central themes at Johannesburg.

The 26 IEA member countries (all of the OECD countries except Iceland, Mexico, Poland and Slovakia) endorsed the report's 25 recommendations in the areas of energy security, energy efficiency, renewables, markets, technology/research, access to energy, transport, and environmental, health and safety concerns.

Among the measures receiving support are removal of import fees; development of common standards and codes; use of market mechanisms to increase the competitiveness of renewables; phasing out of subsidies and ensuring that prices reflect full costs; seeking innovative approaches to financing for renewables; promotion of technology diffusion and development of policies to stimulate the flow of private capital to developing countries (with an emphasis on clean, efficient energy); use of market-based approaches to promote improved fuel economy; making public transport a high priority for developing countries; and emphasizing waste management and security issues in energy production.

Patchy progress on the environment in Europe

Progress in reducing pressures on Europe's environment has been uneven, while pressures on some natural resources (especially fish stocks and land) continue to grow, according to the European Environment Agency's latest annual assessment.

In *Environmental Signals 2002* the EEA also points to positive overall trends with respect to greenhouse gas emissions and waste generation, as well as to confirmed reductions of water and air pollution.

Overall, the European Union stabilized its CO emissions at the 1990 level by 2000, fulfilling its commitment, though emissions began to rise again at the end of this period. The EU's pledge under the Kyoto Protocol has been to cut emissions of six GHGs by 8% by 2008-12 (compared with their 1990 level). According to the latest estimates, the emission total in 2000 was 3.5% less than in 1990; in 1999 this total had been 3.8% lower.

European Mobility Week

In view of the growing success of European Car Free Day, the European Commissioner for the Environment and supporting international organizations have announced that this year's Car Free Day (22 September) will be the culmination of an entire week of activities, to be called European Mobility Week.

The Car Free Day movement began to gather momentum in several European countries in the mid 1990s. The first official EU-wide event took place in September 2000. Some 100 million people in 30 countries participated in 2001. This year's event will focus on the benefits of sustainable transport and transport policies, with days dedicated to public transport (16 September), bicycle use (18 September), and the needs of children and families (20 September).

Details are available at *www.22september.org.*

For more information, contact: Margot Wallström, Commissioner for the Environment, B-1049 Brussels, Belgium, Tel: + 32 2 298 1800, Fax: + 32 2 298 1899, E-mail: margot.wallstrom @cec.eu.int.

Emissions of several air pollutants have been substantially reduced. The total amount of waste is still increasing, but appears to be growing more slowly than the economy. New sewage treatment plants are reducing water body pollution.

The report warns that in many cases such progress is due to large cuts in a few countries or economic sectors: many countries (and some sectors) have not contributed to the positive trends, while time lags before improvements in environmental quality are actually made – combined with high background concentrations of pollutants – mean that these pressures are a continuing concern.

Large areas of natural habitats and farmland are still exposed to acidification. Eutrophication remains a problem in coastal waters. Urban populations continue to be exposed to high concentrations of harmful ground level ozone and fine particles. The EEA report also notes that in the past 20 years the built-up area in major European countries has increased by some 20%, much more rapidly than EU population growth (6%). This has caused loss or disturbance of natural areas and significant fragmentation of animal and plant habitats in most of Europe.

In addition, overfishing is putting many of the commercially important European fish stocks at high risk of collapse despite an overall decline in fleet capacity.

Just days after the report was released, the European Commission announced plans for dramatic cuts in EU trawlers' total time at sea. These plans would entail reducing the fleet by 8.5% (or some 8600 vessels). Aid for building or modernizing vessels would also be eliminated. Instead, it is proposed to fund programmes that would encourage retirement or job changes.

For more information, contact: Tony Carritt, EEA, Kongens Nytorv 6, DK-1050 Copenhagen K, Denmark. Tel: +45 3336 7147, Fax: +45 3336 7198, E-mail: information.centre@eea.eu.int, Internet: www.eea.eu.int. ◆

ASEAN agreement on haze pollution

Environment ministers of ASEAN (the Association of South-East Asian Nations) have signed the first international treaty on transboundary air pollution outside Europe. In the ASEAN Agreement on Transboundary Haze Pollution, drafted with the help of UNEP, the ten member countries have agreed to work together to prevent and control the fires that frequently cover much of this region with a blanket of smoke.

Signed in Kuala Lumpur by Malaysia, Brunei, Cambodia, Indonesia, Laos, Myanmar, the Philippines, Singapore, Thailand and Viet Nam, the agreement formalizes the region's Haze Action Plan. Its prevention mechanism involves controlling sources of fires, establishing warning systems, exchanging information technology and providing mutual assistance. The agreement also requires countries to respond promptly to requests for information by other signatories affected by transboundary haze.

An ASEAN Coordinating Centre for Transboundary Haze Pollution will be established to assist in implementing the agreement.

For more information, contact: ASEAN Secretariat, Jalan Sisingamangaraja 70A, Jakarta, 12110, Indonesia, Tel: +62 21 7243372/7262991, Fax: +62 21 7398234/7243504, Internet: www.aseansec.org or www.haze-online.or.id. ◆

New look at corporate climate change risk

Not only could failure to respond to the risks presented by climate change lead to multi-billion dollar losses for US businesses and investment portfolios, but it could also constitute a breach of fiduciary duty by corporate directors and investment decision-makers. Citing mounting evidence of the financial risks involved, CERES (a coalition of investor and environmental groups that works with over 70 companies on corporate environmental responsibility) says company directors should require management to assess current and probable risk exposure, give shareholders details on companies' greenhouse gas emissions and climate risk exposure, work to reduce emissions following a clear timetable, and link executive compensation to emission abatement, among other recommendations.

In *Value at Risk: Climate Change and the Future of Governance*, CERES, whose investor members represent more than US$ 300 billion in assets, emphasizes that climate change risks affect a wide range of industrial sectors. "The question is no longer whether any given portfolio contains climate risk, but how much," said Robert Massie, the group's executive director.

This report is among the first to establish a direct link between climate change, fiduciary responsibility and shareholder value. It has been released as part of the launch of the Sustainable Governance Project, a CERES initiative designed to improve corporate and investment decision-making on climate change and other social and environmental issues.

The study's findings were announced at about the same time as the US Environmental Protection Agency's 2002 climate report to the United Nations, in which the current administration acknowledged for the first time that human activity is largely responsible for climate change – *and* that the environmental effects may be severe. Following the EPA report's release, the White House expressed some reservations about its conclusions.

In London the world's first nationwide greenhouse gas trading programme got off to something of a slow start, but by the end of its first week BP was engaged in spot trades. One of its first transactions was the sale of 1000 carbon credits to IMERYS (formerly English China Clay), an international mineral processing group. BP, which recently announced that it was eight years ahead of schedule in meeting its internal target of reducing GHG emissions by 10%, made the deal with IMERYS as part of a service designed to help its customers lower their emissions.

Despite initiatives such as the voluntary emission trading programme, a climate change levy and recently announced funding for biomass, tidal and solar energy projects, the UK may need to introduce additional economic measures such as a carbon tax to meet its climate change targets, according to the Royal Society (London).

In other climate change news, a study concerning likely effects on species distribution indicates that most places on Earth will undergo dramatic ecosystem changes within the next 50 years. Using computer modelling, a team led by Townsend Peterson of the University of Kansas has focused on the geographical ranges of 1870 mammals, birds and butterflies in Mexico. Peterson has written in *Nature*: "Although extinctions and drastic range reductions are predicted to be relatively few, species turnover in some local communities is predicted to be high (>40% of species), suggesting that severe ecological perturbations may result."

For more information, contact: Nicole St. Clair, CERES, 11 Arlington Street, Boston, Massachusetts 02116, USA, Tel: +1 617 733 6660, Internet: www.ceres.org. Also see www.defra.gov.uk/environment/climatechange/trading/auction.htm; www.bp.com/environ_social/index.asp; www.royalsoc.ac.uk; and www.nature.com.

The US EPA's Climate Action Report 2002 can be downloaded at www.epa.gov/oppeoee1/globalwarming/publications.car. ◆

French environment report: the downside of growth

Annual economic growth of 3 to 4% between 1998 and 2001 put an alarming amount of pressure on the French environment, according to a report by the French Environment Institute (l'Institut français de l'environnement). In the 2002 edition of its publication *L'Environnement en France*, IFEN points out that:

- France became the world's top tourism destination in 2000, with visits by 75 million foreign tourists;
- housing construction expanded by over 5% in 1999-2000, with peri-urban and coastal areas especially affected;
- from an annual growth rate below 2% in 1997, road freight transport increased to 6% in 1999 (before diesel price increases reduced demand);
- air transport increased by 13.4% between 1990 and 1995, and by 38% between 1995 and 2000;
- there has been a significant increase in freight transit traffic. Road freight transported on Alpine routes has grown by an average 4.8% per year since 1985;
- the volume of packaging for household goods increased by 2.8% per year between 1994 and 1999, and that waste stream accounted for 10%

of the recycling market in 2000.

This is the third report of its type. IFEN notes that the previous report was overly optimistic about France's vulnerability to risk. Disasters during the period covered by the new report include the most violent storms in the country's recorded history, the *Erika* oil spill off the coast of Brittany, a multi-vehicle accident that shut down the Mont Blanc tunnel, catastrophic flooding in the valley of the Somme, and a major chemical plant explosion in Toulouse. These incidents revealed some of the weaknesses in French risk prevention policy.

The period 1998-2001 also witnessed increasing public concern about food safety, with negative and sometimes conflicting reports about "mad cow" disease and GMOs (see related story below). Such concerns have led to greater public debate on environmental matters and demand for more and better information.

IFEN attributes much of the good news contained in its report to technological and legislative controls. Urban air quality, for example, has improved except with respect to ground level ozone. Water quality is improving. Some 95% of the population is now connected to treatment facilities. But the report concludes that on problems involving consumer behaviour, resource exploitation and land use little progress was made.

For more information, contact: IFEN, 61 boulevard Alexandre Martin, 45058 Orléans, Cedex 1, France. Tel: +33 2 38 79 78 78, Fax: +33 2 38 79 78 70, E-mail: ifen@ifen.fr, Internet: www.ifen.fr. ◆

$200 million to deal with obsolete pesticides in Africa

Africa needs nearly US$ 200 million to remove and destroy obsolete pesticides, Amara Essy, Secretary-General of the Organization of African Unity (OAU), has told the OAU Council of Ministers. A further US$ 75 million would be required to establish a mechanism to keep outdated pesticides from accumulating in the future.

The Food and Agriculture Organization estimates the stockpile of obsolete pesticides in Africa at 50,000 tonnes. A steering committee of pesticide industry representatives and governmental and international organizations, including UN agencies and the OAU, is drawing up a proposal to ship these hazardous substances to Europe for destruction.

The steering committee's work has received funding from the Global Environment Facility (GEF) and the World Bank Canadian Trust Fund. The OAU report urged member states to provide in-kind assistance for the project.

For more information, contact: OAU Secretariat, PO Box 3243, Addis-Ababa, Ethiopia, Internet: www.oau-oua.org. ◆

UNU report criticizes focus of GMO field tests

A key selling point of genetically modified plants has been their potential to increase food production in developing countries. However, current testing is more concerned with developing herbicide tolerance and pest resistance than improving yield, according to a study for the United Nations University/Institute for New Technologies in Maastricht, the Netherlands.

While herbicide tolerance and pest resistance do help improve crop yield, only 27.8% of GMO trials in the US and 12.5% of those in the EU directly concern yield. The Institute calls for an increase in public sector research, going beyond biotechnology to cover breeding and other areas involved in increasing yield.

For more information, contact: Lynn Mytelka, Director, UNU Institute for New Technologies, Keizer Karelplein 19, 6211 TC Maastricht, The Netherlands, Tel: +31 43 350 6300, Fax: +31 43 350 6399, E-mail: postmaster@intech.unu.edu, Internet: www.intech.unu.edu. ◆

Women environment leaders meet

Meeting in Helsinki, women environment ministers and women leaders of international governmental and non-governmental sustainable development organizations agreed that climate change, lack of access to water and renewable energy, and degradation of natural resources are among the greatest environmental challenges the world faces.

The Women Leaders on the Environment conference was organized by the Council of Women World Leaders (CWWL) and IUCN-The World Conservation Union. It was co-chaired by Satu Hassi, Minister of the Environment and of Development Cooperation, Finland, and Ms. Rejoice T. Mabudafhasi, Deputy Minister of Environmental Affairs and Tourism, South Africa.

In their closing statement participants emphasized that a majority of the world's poor are women. They will continue to suffer disproportionately if these challenges are not met. Among other conclusions, the statement urged governments to enhance women's participation in trade and investment; use gender-sensitive sustainability assessments of fiscal, trade and investment policies; enhance use of economic instruments, market incentives and policies to internalize external environmental costs and benefits; move towards phasing out environmentally harmful subsidies; create "an enabling environment" to increase the flow of foreign direct investment to developing countries; provide incentives for cleaner, more energy- and resource-efficient production methods; promote corporate social and environmental responsibility and accountability; and monitor the effects of privatization of environmental goods and services on women and local communities.

For more information, contact: Ministry of the Environment, PO Box 35, FIN-00023 Government, Finland, Tel: +358 9 160 07, Fax: +358 9 160 39545, Internet: www.vyh.fi/eng. ◆

Monterrey Consensus adopted

More than 50 heads of state and government have asserted their resolve to eradicate poverty, achieve sustained economic growth, and promote sustainable development within a fully inclusive and equitable global economic system.

The International Conference on Financing for Development in Monterrey, Mexico, brought together 51 presidents and prime ministers, along with finance and foreign ministers, leaders of international organizations and financial institutions (as well as business and civil society leaders) to discuss the challenges of development financing and poverty alleviation.

The national leaders' statement, the Monterrey Consensus, was adopted by acclamation. It includes a commitment to strengthen the United Nations as the main organization to revamp the international financial system, working with the World Bank, the International Monetary Fund and the World Trade Organization.

UN Secretary-General Kofi Annan told participants: "We are here to discuss the fate of people. Not people in the abstract, but million upon million of individual men, women and children."

One of the many side events, on "Financing for Development: A Private Sector Financial Services Perspective", was organized by UNEP's Economics and Trade Branch

For more information, contact: Department of Economic and Social Affairs, Room DC2-2320, United Nations, First Avenue at 46th Street, New York, NY 10017, USA, Tel: +1 212 963 5959, Fax: +1 212 963 1010, Internet: www.un.org/esa/ffd. ◆

Industry Updates

US toxic releases continue to decline

Mining, manufacturing, and the electric power sector remained the largest contributors of toxic releases to the environment in the United States in 2000, according to the Environmental Protection Agency's annual Toxics Release Inventory (TRI) report. However, trends in releases are continuing to decline.

The new TRI, the first to contain details on persistent bioaccumulative chemicals such as dioxins, mercury and PCBs, indicates that total releases have decreased by some 48% since 1988. Between 1999 and 2000, chemical releases reported to the EPA fell from 7.8 billion pounds to 7.1 billion. About 27% of releases were to air, 4% to water and 69% to land.

Metal mining accounted for 47% of the total, down over 14% since 1999. Manufacturing's share was 32%, down 2.6%. Electricity generation accounted for 16%, down 3%.

A related report for 1999 shows that factories, electric utilities, hazardous waste management facilities and coal mines in Canada and the US generated almost 3.4 million tonnes of toxic waste in that year. The Commission for Environmental Cooperation (CEC) of North America released its annual *Taking Stock* report shortly after the TRI came out. The CEC analyzes data from the two countries' national pollutant release and transfer registers.

Reporting on the 210 chemical substances common to both national programmes, the CEC also presented its first five-year analysis of pollution releases and management. The five-year trend shows little overall change in the total amount of toxic chemicals generated, but a major change in the media receiving the pollutants. The North American manufacturing sector reduced releases to air by 25%, but on-site releases to land increased by 25% and off-site releases (mostly to landfills) by 35%; releases to lakes, rivers and streams increased by 26% over the five years studied.

The 2000 US data and other information are available at *www.epa.gov/tri*. A link from this site to a research tool, TRI Explorer, enables users to analyze data according to facility, chemical or industry and at county, state or national level. The latest data are based on approximately 91,500 forms submitted by 23,500 facilities.

For more information, contact: EPA Information Resource Center, 1200 Pennsylvania Avenue, N.W., Washington, DC, 20460, USA, Tel: +1 202 260 2090, E-mail: public-access@epa.gov, Internet: www.epa.gov; and the North American Commission for Environmental Cooperation, 393 rue St-Jacques Ouest, Bureau 200, Montréal (Québec), H2Y 1N9, Canada, Tel: +1 514 350 4300, Fax: +1 514 350 4314, E-mail: info@ccemtl.org, Internet: www.cec.org/takingstock. ◆

Mining initiative ends with report and conference

The three-year Global Mining Initiative, launched by nine major mining company CEOs, has wrapped up its work with the release of the Mining, Minerals and Sustainable Development (MMSD) project report and an international conference in Toronto. However, participants in the "Resourcing the Future" conference said the real work has just begun.

The independently produced MMSD report, *Breaking New Ground*, calls for:

- elaboration of an industry protocol for sustainable development;
- a commitment to address the negative legacy of the past;
- support for legalization of artisanal and small-scale mining;
- integrated management of the full mineral chain (exploration, extraction, smelting, refining, fabrication, manufacturing, use, reuse, recycling and disposal);
- more effective government management of mineral investment;
- a more equitable international trade regime for minerals.

"From the industry perspective, taking part in this [study] was a risky business," said Sir Robert Wilson, CEO of Rio Tinto and chairman of the three-day conference where the report was discussed. But he added that doing nothing to address "the widespread negative attitudes to our activities" would eventually have meant a bigger risk – that of being cut off from resources and markets.

The report and conference were two of this initiative's three main components. The third component was the formation of the International Council on Mining and Metals, a new global leadership body for the industry. Following the conference, the ICMM Council adopted the ICMM Toronto Declaration. Among the commitments made are to:

- develop best practice protocols that encourage third-party verification and public reporting;
- engage in constructive dialogue with key constituencies;
- help members understand the concepts and application of sustainable development;
- seek to enhance effective community development management tools and systems;
- promote the concept of integrated materials management;
- create an emergency response regional register. ◆

Reducing the impact of mobile phone waste

By 2005 the number of mobile phones "retired" each year in the United States alone will reach around 130 million, presenting a potential toxic waste problem of major proportions. According to *Waste in the Wireless World: The Challenge of Cell Phones*, these phones are typically used only 18 months before being replaced. The report, issued by INFORM, a private environmental research organization, says the waste stream will be nearly 60,000 tonnes per year.

Mobile phones and other wireless electronic devices (personal digital assistants, portable e-mail devices, pagers, pocket PCs, MP3 music players) are made of similar materials and present similar waste management problems, not least the amount of toxic material they contain. But a British company sees "retired" mobile phones as a gold mine – literally. XS Tronix has launched recycling campaigns in conjunction with the Tesco supermarket chain and Comet, an electronics retailer. XS Tronix says it sends usable phones to developing countries and recovers materials such as gold and palladium from the others. For each phone returned, customers may ask that a donation be made to a non-profit group and/or receive credits, to be used at the participating retailer.

For more information, contact: Emily Brown, INFORM, Inc., 120 Wall Street, New York, NY 10005, USA, +1 212 361 2400, ext. 250, Fax: +1 212 361 2412, E-mail: brown@informinc.org, Internet: www.informinc.org/cellphone.htm; and XS Tronix, Seely House, 1 Seely Road, London SW17 9QP, UK, Tel: +44 208 274 4040, Fax: +44 208 274 5050, E-mail: info@xstronix.com, Internet: www.xstronix.com. ◆

SRI survey highlights Henderson, Storebrand, Trillium

A report on socially responsible investment (SRI) says Henderson Global Investors, Storebrand Asset Management (Norway) and Trillium Asset Management (United States) are among the world's top fund managers in terms of SRI best practice.

Swedish-based MISTRA, The Foundation for Strategic Environmental Research, was joined in the study by Miljöeko, a Swedish consulting firm, and SustainAbility of the UK. Covering 142 SRI products from 77 fund managers based in Europe and the US, the study defines six best practice characteristics:

- a triple bottom line approach;
- a focus on best in class and pioneers/innovators;
- evaluation of sustainability opportunities and sustainability risks;
- use of an intelligent screening model;
- a qualified research team; and
- open screening procedures.

Henderson, based mainly in the UK and Australia, and Storebrand are both long-time participants in UNEP's Financial Initiatives. UNEP and SustainAbility work together on the Engaging Stakeholders series of publications.

For further information, contact: MISTRA, Gamla Brogatan 36-38, SE 111-20 Stockholm, Sweden. Tel: +46 8 791 10 20. Fax: +46 8 791 10 29. E-mail: mail@mistra.org. Internet: www.mistra.org/eng; www.sustainablefuturefunds.com; and www.storebrand.com. ◆

UNEP Focus

Global Environment Outlook-3: Earth at the crossroads

Over 70% of the Earth's land surface could be affected by roads, mining, cities and other infrastructure development in the next 30 years unless urgent action is taken, according to UNEP's new *Global Environment Outlook-3* report. *GEO-3* says the Latin America and Caribbean region is likely to be hardest hit, closely followed by the Asia and Pacific region.

GEO-3 reviews policies and environmental impacts over the past 30 years and then outlines four policy approaches for the next three decades, comparing their likely effects on people and the natural world. Among its findings:

- Over half the world population could be living in severely water-stressed areas by 2032 if market forces drive the planet's political, economic and social development. West Asia, which includes the Arabian Peninsula, would probably be the worst affected.
- The proportion of hungry people in the world seems likely to fall. According to one scenario, hunger could affect as little as 2.5% of the global population by 2032, in line with the goals of the United Nations Millennium Declaration.
- Concerted action involving governments, industry and individual citizens could produce deep cuts in greenhouse gas emissions. With sufficient public and private will, atmospheric CO_2 levels could begin to stabilize by 2032.

The report says the Earth is at a crossroads: choices made today are critical for the forests, oceans, rivers, mountains, wildlife and other life support systems upon which current and future generations must depend.

The planet's declining environmental quality and an apparent increase in the strength and frequency of events such as cyclones, floods and droughts is intensifying vulnerability to food insecurity, ill health and unsustainable livelihoods. There is evidence that the gap between those who can cope with rising levels of environmental change and those who cannot is becoming wider.

Klaus Toepfer, UNEP's Executive Director, called the GEO-3 "the most authoritative assessment of where we have been, where we have reached and where we are likely to go." He added that the data it contains "underline the huge amount of knowledge that has now been accumulated about the condition of Earth."

"It would be a disaster to sit back and ignore the picture painted," Toepfer told journalists at the launch of the report.

Over 1000 people, many of them from UNEP's global network of collaborating centres, helped prepare *GEO-3* (see book review, page 48.)

For more information, contact: Division of Early Warning and Assessment, UNEP, PO Box 30552, Nairobi, Kenya. Tel: +254 2 623562. Fax: +254 2 623943/44. E-mail: unep@unep.org.

To download GEO-3 free, go to www.unep.org/geo3. Other GEO-3 sites are based in Japan: www-cger.nies.go.jp/geo; Mexico: www.rolac.unep.mx/geo3; Switzerland: www.grid.unep.ch/geo3; the UK: www.unep-wcmc.org/geo3; and the United States: grid.cr.usgs.gov/geo3. ◆

World Environment Day

Klaus Toepfer, Executive Director of UNEP, focused his annual World Environment Day message on the mountains and ecotourism, as 2002 is both the International Year of Mountains and the International Year of Ecotourism. After referring to the findings of a UNEP-backed team that just returned from an expedition to the Himalayas, he said: "Although mountains have been revered since time began, such beliefs are no longer enough to preserve fragile mountain ecosystems for the well-being of all. We face an immense challenge, the challenge of ensuring their stability and preservation for the generations to come."

Imja (Island Peak), glacier lake, Himalayas

Among its findings, the Himalaya team reported that the glacier from which Sir Edmund Hillary and Tenzing Norgay set out to conquer Mount Everest nearly 50 years ago has retreated about five kilometres up the mountain. An earlier report from UNEP's Regional Resource Centre for Asia and the Pacific says temperatures in the Himalayas have risen almost 1 degree Celsius (1.8 degrees Fahrenheit) since the mid 1970s. Increased melting from snowfields and glaciers has filled some 50 high-lying lakes to nearly overflowing, increasing the threat of major flooding in the next five to ten years.

The expedition members "have recorded in words, in photographs, and on film the dramatic impacts that global warming is having on glaciers," said Toepfer. "The expedition has also looked at the impacts of tourism on the mountains, concluding that much of what is happening is environmentally damaging."

Referring to the theme of World Environment Day 2002, he added: "This year especially, faced with the findings of our climbers ... I urge you to 'Give Earth a Chance'. I ask you to look at our daily impact on the planet and its peoples, and to take action to improve our environmental behaviour."

Calling sustainable development "a must", he continued: "We need to combine the environmental dimension with social activity and economic development. This must be our common target, especially in mountain regions. It is not enough to simply say we have a conservation plan for nature, and natural resources. We must give people a chance to live and survive in these regions.

"Mountains attract tourists, but tourism has to be well managed to minimize impact on sensitive mountain environments. Respect should be the byword [and this] includes paying local people a decent wage sourcing local food and materials where possible, and observing local customs, beliefs and traditions. Tourists are guests in other peoples' ecosystems and should behave as such."

Members of the Global 500 Environmental Forum, which helps keep UNEP Global 500 laureates in communication with one another, spent World Environment Day in Shenzhen, China, the international host city for 2002. This year's Global 500 winners included Shenzhen and another Chinese city, Chifeng, in Inner Mongolia, along with Princess Basma Bint Ali of Jordan and environmental groups from Angola, Ecuador, Kazakhstan, the Philippines and the United States.

For more information, contact: Robert Bisset, UNEP Press Officer and Europe Spokesperson, Tel: +33 6 22 72 58 42 (mobile), E-mail: robert.bisset@unep.fr, Internet: www.unep.org/wed/2002/default.asp. ◆

Message from UN Secretary-General Kofi Annan

The theme of this year's World Environment Day, "Give Earth a Chance," is meant to convey a message of urgency about the state of the earth and the broader quest for sustainable development.

Sustainable development rests on three pillars: economic growth, social progress and protection of our environment and natural resources. When the idea first burst onto the scene in 1987 with the publication of *Our Common Future*, it was meant to go beyond the ecosystem approaches of the past.

In 1992, at Rio de Janeiro, the international community achieved a conceptual breakthrough. No longer, it was hoped, would environmental issues be regarded as a luxury or afterthought. Rather, they would become a central part of the policy-making process, integrated with economic and social development. Developing countries would be helped to pursue a more environmentally sound path to modernization than that followed by the developed countries. The big picture – a positive vision of long-term growth, equity, justice and environmental protection – seemed firmly in view.

Despite this advance, and despite considerable efforts and significant achievements since the "Earth Summit", the latest readings reveal a planet still in need of intensive care. Poverty, pollution and population growth; rural poverty and rapid urbanization; wasteful consumption habits and growing demands for water, land and energy continue to place intense pressures on the planet's life support systems, threatening our ability to achieve sustainable development.

There is little chance of protecting the environment without a greater sense of mutual responsibility, especially in an age of interdependence, and especially since the environmental "footprint" left by some societies is so much larger than that left by others. I hope that all states and all stakeholders will come together at the World Summit on Sustainable Development in South Africa later this year, and that the breakthrough this time, ten years along the path from Rio, will be real and tangible.

New Basel guidelines on safer battery recycling

In an effort to reduce the risks of lead poisoning, the secretariat of the Basel Convention on hazardous wastes has finalized guidelines promoting environmentally sound recycling of lead-acid batteries, the world's greatest source of secondary lead.

In developing countries the lead-acid batteries used in automobiles, industrial facilities and portable tools are often recycled in the informal sector by unprotected workers. Few of the specialized firms equipped for safe recycling of these batteries are found in these countries.

Of the 2.5 million tonnes of lead produced annually worldwide, some 75% goes into lead-acid batteries. The new Basel guidelines are intended to improve their management by enabling governments to develop the legislation and facilities needed to cope with dramatic growth in the quantity of used batteries. They set out best practices and principles for effective recycling systems.

The secretariat stresses the importance of rigorous controls, economic incentives, appropriate technologies and stable market conditions.

For more information, contact: Michael Williams, UNEP Geneva, 9-15 chemin des Anémones, CH-1219 Châtelaine, Geneva, Switzerland, Tel: +41-22-917-8242/44, E-mail: michael.williams@unep.ch, Internet: www.basel.int. ◆

Biodiversity conference adopts genetic resource guidelines

Some 120 ministers at the sixth Conference of the Parties to the Convention on Biological Diversity adopted the first detailed guidelines on access to genetic resources and sharing of the benefits from them. They also outlined global action on biodiversity through the rest of the decade and adopted an international work programme on forests and principles for combating alien invasive species.

The voluntary guidelines on genetic resources are intended to improve the way foreign companies, collectors, researchers and other users gain access to genetic resources and share the benefits with the countries of origin and with local and indigenous communities.

"Contracts based on the guidelines will give biodiversity-rich countries additional incentives to conserve and sustainably use their resources," said Hamdallah Zedan, Executive Secretary of the Convention. "They will offer local and indigenous communities with traditional knowledge fair compensation. And they will ensure a good deal for seed companies, plant breeders, and industries seeking genetic resources."

For more information, contact: Michael Williams, Tel: +41 22 917 8242, E-mail: michael.williams@unep.ch, Internet: www.biodiv.org. ◆

More findings on DU contamination in the Balkans

A UNEP study of six sites in Serbia and Montenegro struck by depleted uranium (DU) munitions during fighting in 1999 confirms the presence of widespread but low-level contamination at five of the sites.

The UNEP team's report (see book review, page 52) says the contamination does not immediately present significant risks for the environment or human health. These findings are consistent with those of a similar study in Kosovo released last year. The two reports cover the entire geographical area affected by DU munitions during the Kosovo conflict.

UNEP nevertheless recommends that authorities take precautionary measures, the most important concern being potential groundwater contamination by ammunition tips made of DU, which are corroding rapidly. A new finding of particular interest was the detection of airborne DU particles at two sites, which could have implications for site decontamination and construction work.

"The team was surprised to find DU particles still in the air two years after the conflict's end," said Pekka Haavisto, chairman of the assessment team. "Based on these findings, the authorities should carefully plan how DU-targeted sites are used in the future. Any soil disturbance at these sites could risk releasing DU particles into the air."

The study was conducted in cooperation with the International Atomic Energy Agency (IAEA) with additional support from the World Health Organization. It was funded by the Government of Switzerland.

For more information, contact: Pekka Haavisto, +41 79 477 0877, E-mail: pekka.haavisto@unep.ch, Internet: http://postconflict.unep.ch. ◆

Institute of Water and Environment becomes UNEP Collaborating Centre

The DHI Institute of Water and Environment in Denmark has been made a full-fledged UNEP Collaborating Centre on Water and Environment. The institute has been an active UNEP partner since 1996. The new arrangement, which includes common financial and technical agreements, broadens the partnership.

Other UNEP "centres of excellence" include the Collaborating Centre on Energy and Environment at Risø National Laboratory (Denmark), GRID-Arendal (Norway) and the World Conservation Monitoring Centre (Cambridge, England).

The new centre draws on the expertise of over 300 water professionals employed by DHI as well as the institute's global water sector networks, which include experts, authorities and organizations involved in water management around the world. The center, run by a small permanent secretariat, is directed by a steering committee made up of representatives from UNEP, Danida (the Danish development agency) and DHI.

For more information, contact: Niels Henrik Ipsen, UNEP Collaborating Centre on Water and Environment, Hørsholm, Denmark, Tel: +45 4516 9518, E-mail: nhi@dhi.dk, Internet: www.dhi.dk. ◆

Study supports making GRI the standard

Researchers from Sweden's International Institute for Industrial Environmental Economics say that a "patchwork" of unrelated national regulations for corporate environmental reporting could be very costly and inefficient for multinational companies.

The IIIEE report calls for national governments and businesses to support international efforts related to global standards for environmental reporting, such as the Global Reporting Initiative (GRI). The study was carried out to provide guidance on the feasibility of a proposal for mandatory corporate environmental reporting in Japan.

It has also been announced that the permanent secretariat of the GRI programme (formally inaugurated recently at United Nations headquarters in New York) will be in Amsterdam. The programme is expected to become a UNEP Collaborating Centre later this year.

For more information, contact: Mark Brownlie, Global Reporting Initiative, E-mail: brownlie@globalreporting.org, Internet: www.globalreporting.org. ◆

UNEP Division of Technology, Industry and Economics (DTIE) HIGHLIGHTS

Between industry efforts and environmental needs, a growing gap

The gap between business and industry efforts to reduce their environmental impacts and the need to address the worsening state of the planet is growing wider, the Division of Technology, Industry and Economics reports in one of UNEP's key contributions to the World Summit on Sustainable Development.

According to *10 Years After Rio: The UNEP Assessment*, the main reason for this widening gap is that in most sectors only a few companies are actively striving for sustainability through integrating social and environmental factors into business decisions. The report also says the improvements that have been made are more than offset by economic growth and increasing demand for goods and services.

The Life-Cycle Initiative: cleaner from cradle to grave

In response to the environmental risks posed by rapid growth in worldwide consumption, UNEP has introduced a new programme aimed at making production processes and products cleaner.

The Life-Cycle Initiative, a joint effort by UNEP and the Society of Environmental Toxicology and Chemistry, is designed to help governments, businesses and consumers adopt more environmentally friendly policies, practices and life-styles through the use of life-cycle assessment (LCA).

LCA is the systematic evaluation of the environmental aspects of a product or service system through all stages of its life-cycle. Ideally, it provides the information necessary to establish environmentally sustainable practices from cradle to grave. The Life-Cycle Initiative will develop and disseminate practical tools for evaluating the opportunities, risks and trade-offs associated with a given product or service over its whole life cycle.

The initiative was launched in Prague at the start of UNEP's seventh International High-Level Seminar on Cleaner Production (CP-7), the biennial global conference on progress in promoting sustainable production and consumption. CP-7 will be the theme of the next issue of *Industry and Environment*.

For more information, contact: Bas de Leeuw, UNEP Sustainable Consumption Programme, 39-43 quai André-Citroen, Paris 75739 Cedex 15, France. Tel: +33 1 44 37 30 09. Fax: + 33 1 44 37 14 74. E-mail: bas.deleeuw@unep.fr. Internet: www.uneptie.org/sustain/lca/lca.htm.

Tokyo LCA workshop

The UNEP/SETAC Life Cycle Initiative was initiated in Tokyo in late 2001. Over 150 participants attended its first official workshop, which focused on best practice in LCA, the role of the initiative, and future research needs.

The workshop gave special attention to cooperation with Asian countries on LCA. It was sponsored by the Research Center for LCA of the Japanese National Institute of Advanced Industrial Science and Technology (AIST). In opening the workshop, Atsushi Inaba of AIST, Vice Chairman of the International Life Cycle Panel, called for concerted action to establish best practice based on scientific findings.

Providing an overview of industry progress on sustainability issues, *10 Years After Rio* accompanies and draws upon 22 global reports written largely by representatives of industry sectors ranging from accounting and advertising to waste and water management. The reports are known collectively as *Industry as a Partner for Sustainable Development* (see book review, page 51).

Klaus Toepfer, UNEP's Executive Director, said when the reports were launched: "Some companies have risen to the challenge. Such efforts need to be acknowledged and applauded. However, the new reports clearly show that progress since Rio has been uneven within and amongst industry sectors and countries. ... [W]e have found that the majority of companies are still doing business as usual."

The process that culminated in the publication of the reports involved unprecedented cooperation by industry with UN, labour and NGOs.

In response to the findings, UNEP has identified priorities and makes recommendations including spreading the use of practices that bring "triple dividends" – economic, environmental and social; better integrating environmental and social criteria into mainstream business decision-making; and improving implementation and monitoring of voluntary initiatives and industry self-regulation.

"Significant efforts have been made by participating industries in reducing their ecological footprint," said Jacqueline Aloisi de Larderel, UNEP's Assistant Executive Director and Director of DTIE. "But it is in industry's own self-interest to do more to spread best practice and raise the performance levels of all its members everywhere. Not enough companies, particularly small and medium-sized ones, are leading the way, and there is insufficient monitoring."

She added: "There is a growing awareness among business and industry that the social side of global sustainable development needs to be taken into account alongside environmental and economic aspects."

Increased awareness is often reflected in more environmental reporting and the development and use of tools like ISO 14000, life-cycle management and voluntary commitments to integrate sustainability into business strategies and activities.

The reports cover the accounting, advertising, aluminium, automotive, aviation, chemical, coal, construction, consulting engineering, electricity, fertilizer, finance and insurance, food and drink, information and communications technology, iron and steel, oil and gas, rail, refrigeration, road transport, tourism, waste management and water management sectors.

For more information, contact: Robert Bisset (see above) or consult the reports at www.uneptie.org/outreach/wssd/publications/publications.htm ◆

New regional approach for OzonAction

UNEP has radically altered its approach to helping developing countries meet their commitments to phase out chlorofluorocarbons and other ozone-depleting substances.

With the compliance phase of the Montreal Protocol now in force, the type of assistance developing countries need to implement it has changed. In response, the OzonAction Programme established a new Compliance Assistance Programme to provide direct, tailor-made assistance that reflects countries' unique societal and economic conditions.

Developing countries that are party to the Protocol must follow a schedule to phase out production and consumption of chlorofluorocarbons and halons by 2010, with other substances to follow. Developed countries phased out CFCs by 1996, except for a few essential uses and production for basic domestic needs of developing countries.

By putting teams of technical and policy experts in UNEP's Regional Offices in Bahrain, Bangkok, Nairobi and Mexico City, the new programme provides direct assistance by experts with in-depth knowledge of national conditions and the regional context.

"This innovative regional delivery approach may set a trend in supporting compliance with other multilateral environmental agreements," said Jacqueline Aloisi de Larderel, Assistant Executive Director of UNEP and Director of DTIE.

In addition, DTIE's OzonAction and Cleaner Production programmes are collaborating on a voluntary initiative aimed at accelerating the phase-out of ozone-damaging chemicals across India. They are also backing a nationwide public awareness campaign targeted at the thousands of

l and medium-sized Indian companies that art of the CFC supply chain. It is hoped that ampaign will help combat the smuggling of s in South and Southeast Asia.

nder the Pledge Programme, India's "big four" makers have agreed to crack down on "rogue sions" released during production by introng cleaner production technologies. They are ommitted to increase awareness of the Mon- Protocol through informing shareholders, loyees, dealers and buyers about activities ed to the CFC production phase-out and to oting ozone-friendly products, technologies ractices to suppliers and business partners.

dia is the world's second largest CFC pro- after China. It received US$ 82 million in to assist in the phase-out of these chemicals r the terms of the Montreal Protocol. India's onal Cleaner Production Centre is also lved in this initiative. The four companies erned are Chemplast Sanmar, Gujarat Fluoemicals, Mafatlal Industries and SRF Ltd. accounted for 16% of world CFC produc- in 1998.

r more information, contact: Rajendra Shende, l of Energy and OzonAction Branch, 39-43 André-Citroen, Paris 75739 Cedex 15, France, +33 1 44 37 14 50, Fax: + 33 1 44 37 14 74, il: ozonaction@unep.fr, Internet: www.unep-g/ozonaction. ◆

um for ICT companies in Asia-Pacific region

gates to the first Asia-Pacific Regional Conce on Environmental Issues in Telecommuions have decided to establish a regional n for information and communications techgy companies in the region. Claudio Senese ustralia's Telstra was invited to chair the n.

lstra joined the industry-wide Global e-Susbility Initiative, or GeSI, during the confer- as did Asia Satellite Telecommunications Vodafone. GeSI, an initiative of ICT service ders and suppliers, is supported by UNEP the International Telecommunication n.

e conference, which took place in Hong , focused on environmental aspects of the industry. Recognizing that without special tion this industry can cause significant envi- ental harm, delegates agreed that a regional n could help increase understanding of nsible environmental management as well as oting the environmental benefits the indusan deliver. Improved recycling and lower y use by ICT equipment and infrastructure highlighted.

r more information, contact: Ama Dadson, Secretariat, UNEP Division of Technology, stry and Economics, 39-43 quai André-Cit- 75739 Paris Cedex 15, France, Tel: +33 1 44 6 23, Fax: +33 1 44 37 14 74, E-mail: unep.fr, Internet: www.gesi.org. ◆

Governments lagging badly on sustainable consumption

In a joint report on survey results, UNEP and Consumers International conclude that three years after the UN General Assembly ratified the sustainable consumption section of the UN Guidelines for Consumer Protection, governments have made little progress on implementation.

Of the 150 governments that approved the guidelines in 1999, only 52 responded to the survey. Among those not responding were "some of the biggest resource-consuming countries," said Louise Sylvan, President of Consumers International. Of governments responding, over 38% indicated they were not aware of the guidelines' existence.

Among respondents, 56% promote research on sustainable consumption, the same percentage use economic instruments such as green taxes, and 54% measure national progress towards more sustainable consumption patterns. In each case these percentages were considered disappointing. Sylvan, who also heads the Australian Consumers' Association, commented that "Governments clearly need to lift their game."

"Governments have made a start but clearly much more still needs to be done," added Klaus Toepfer, UNEP's Executive Director.

More encouragingly, 80% of respondents said they found the guidelines useful for policy-making and an equal percentage had initiated information campaigns on sustainable consumption.

As a result of these findings, UNEP and Consumers International are calling for a time-bound programme of implementation by 2004 involving not only governments, but also stakeholders such as National Cleaner Production Centres.

For more information, contact: Bas de Leeuw (see above) or consult the full report, Tracking Progress: Implementing Sustainable Consumption Policies, at www.consumersinternational.org (E-mail: consint@consint.org) or www.uneptie.org/pc/sustain/guidelines/documents.htm. ◆

World Ecotourism Summit in Quebec

Over 1100 delegates from 133 countries attended the first World Ecotourism Summit in Quebec City, Montreal. The three-day event was sponsored by UNEP, the UN-affiliated World Tourism Organization, the Canadian Tourism Commission, and Tourisme Québec.

Participants worked to clarify the concept of ecotourism and determine what is needed to ensure that this type of tourism can develop harmoniously while respecting fragile ecosystems and local populations. Major discussions covered ecotourism policy and planning; regulations; product development and marketing and promotion; and monitoring costs and benefits.

"The impressive number of stakeholders and ecotourism practitioners that were able to participate in the summit offers great hope for the full implementation of the Quebec Declaration," said Oliver Hillel, coordinator of UNEP's Tourism Programme.

The Quebec Declaration on Ecotourism, the key outcome of the event, is intended to aid in responsible international development of ecotourism. The document will be presented at the World Summit on Sustainable Development in Johannesburg.

Hillel said the meeting in Quebec, one of the high points of the International Year of Ecotourism, "signaled that ecotourism, in practice, can contribute to poverty alleviation and environmental protection, the twin goals" of the WSSD.

For more information, contact: Oliver Hillel, UNEP Tourism Programme, 39-43 quai André-Citroen, Paris 75739 Cedex 15, France, Tel: +33 1 44 37 76 21, Fax: + 33 1 44 37 14 74, E-mail: oliver.hillel@unep.fr, Internet: www.uneptie.org/pc/tourism. ◆

UNEP Finance Initiatives' Global Roundtable

Ten years after the Earth Summit, UNEP's Finance Initiatives (under DTIE's Economics and Trade Branch) returned to Rio de Janeiro for their 2002 Global Roundtable. The event was titled "Financing a Sustainable Future: Strategies, Partnerships, and Opportunities…on the way to Johannesburg 2002".

Over the two days of the conference, about 300 participants from around the world discussed challenges and opportunities for sustainable finance and established new partnerships, both global and regional. Topics of interactive workshops included microfinance, venture capital, and environment and security.

One outcome of the meeting is that UNEP FI members are developing recommendations as part of the Financing for Development process, in the run-up to the World Summit on Sustainable Development in Johannesburg.

Also in Rio, UNEP FI welcomed KPA, a financial services company from Sweden, as the 91st signatory to the Statement of Environmental Commitment by the Insurance Industry. KPA is a pension fund with $1.5 billion in assets.

For more information, contact: Trevor Bowden, Economics and Trade Branch, 9-15 chemin des Anémones, CH-1219 Châtelaine, Geneva, Switzerland, Tel: +41 22 917 8178, Fax: +41 22 917 8076, E-mail: trevor.bowden@unep.ch, Internet: www.unep-fi.net/rio. ◆

Consumption booklet and web site target youth

The UNEP/UNESCO Initiative on Youth and Sustainable Consumption has released its final product, a booklet called *YouthXchange: The Guide*. There is a related web site. Both are subtitled *Training Kit on Responsible Consumption*; together they aim to help youth, NGOs and educators set up awareness-raising events and training sessions on the adoption of more sustainable lifestyles.

The booklet describes the impact of current consumption patterns on the environment and human rights. It also highlights the opportunities offered by more sustainable lifestyles (see book review, page 49). The web site addresses communication with youth on consumption issues, using information material, case studies, games and best practices.

For more information, contact: Isabella Marras, UNEP DTIE, 39-43 quai André-Citroen, Paris 75739 Cedex 15, France. Tel: + 33 1 44 37 14 21, Fax: + 33 1 44 37 14 74, E-mail: isabella.marras@unep.fr, Internet: www.youthxchange.net. ◆

Reports emphasize importance of fishery policies

Sharp declines in catches of key fish stocks off the west coast of Africa are related to overfishing by foreign fleets, delegates were told at a UNEP fisheries workshop in Geneva. The theme of the workshop was links between international trade and subsidies and their social and environmental impacts.

Off Mauritania, for example, where boats from the EU, Japan and China have access to fishing grounds, catches of octopus have fallen by half in the past four years and some species (e.g. sawfish) have completely disappeared, according to a new report commissioned by DTIE's Economics and Trade Branch.

A second report, on Bangladesh, indicates that marine stocks there could support more fishing, which could generate employment and foreign exchange earnings for one of the world's poorest countries. However, findings from Mauritania, Senegal and Argentina show that without strict safeguards in place before fishing is increased, or foreign fleets are invited in, Bangladesh's fish stocks could become vulnerable to overexploitation. This would put much needed food supplies at risk rather than generating income.

The workshop preceded formal negotiations on trade and the environment, including negotiations on reducing fishing subsidies, by the Committee on Trade and the Environment of the World Trade Organization.

Hussein Abaza, chief of the Economics and Trade Branch, said: "We are slowly amassing a wealth of hard facts about the complex relationship between trade liberalization, subsidies and their environmental and social impacts, especially in the area of fisheries."

These data, he said, make it clear that trade and fishery policies need to be reformed to support sustainable management of fisheries. "The country studies we have commissioned ... offer pointers to the actions needed so that trade in fish contributes to development and sustains marine ecosystems."

Moreover, six Central American countries have signed an agreement that is likely to lead to substantial decreases in pollution and improved conservation of fish stocks in the Northeast Pacific. The Convention on Cooperation in the Protection and Sustainable Development of the Marine and Coastal Environment of the Northeast Pacific was signed by Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama in Antigua, Guatemala. Mexico and Colombia have indicated they will also sign the Convention later this year.

This agreement should lead to better conservation and an improvement in the quality of key coastal habitats including mangrove swamps, coral reefs and beaches, upon which millions of people depend for food, construction materials and income from industries such as tourism.

For more information, contact: Hussein Abaza, Economics and Trade Branch (see address above), Tel: +41 22 917 8298, E-mail: hussein.abaza@unep.ch. ◆

Books & Reports

General

Tomorrow's Markets: Global Trends and Their Implications for Business

Using a wealth of illustrations, *Tomorrow's Markets* concisely sums up key data on 19 topics related to how the world does business: population, wealth, nutrition, health, education, consumption, energy, emissions, efficiency, ecosystems, agriculture, water, urbanization, mobility, communications, labour, democracy, accountability and privatization. It also assesses what trends in each area mean for business. *Tomorrow's Markets* is a joint publication of the World Resources Institute, UNEP and the World Business Council for Sustainable Development. It is available on line at *www.uneptie.org/outreach/wssd/TM/pub_TM.htm.*

(2002). WRI, UNEP, WBCSD. Available from Earthprint Ltd., PO Box 119, Stevenage, SG1 4TP, Hertfordshire, UK. Tel: +44 1438 748111, Fax: +44 1438 748844, E-mail: orders@earthprint.com, Internet: www.earthprint.com. Pbk., 61p. ISBN 1-56973-497-6.

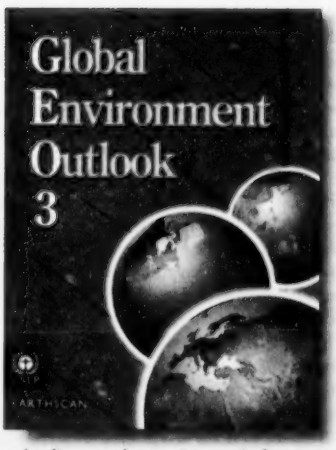
State of the World 2002

This annual report on progress towards a sustainable society is one of two key publications of the Worldwatch Institute (*Vital Signs 2002*, which reports on trends shaping the future, will be reviewed in the next issue of *Industry and Environment*). This year's *State of the World* is a special WSSD edition, and the Foreword was contributed by UN Secretary-General Kofi Annan. *State of the World 2002* provides a broad overview of sustainability, with chapters on climate change, sustainable agriculture, humans' "toxic burden", international tourism, repression and conflict, population, and global governance.

Worldwatch Institute (2002). W.W. Norton & Co., 500 Fifth Avenue, New York, NY, 10110, USA. Tel: +1 212 354 5500, Fax: +1 212 869 0856, Internet: www.wwnorton.com. Pbk., 265p. ISBN: 0-393-32279-3.

Global Environment Outlook 3

UNEP's flagship publication analyzes the latest reliable data and other information available on land, forests, biodiversity, fresh water, coastal and marine areas, the atmosphere, urban areas and natural and human-caused disasters. As this is the third such publication since 1972, *GEO-3* starts with a review of the environment and environmental policy over the past 30 years before setting out four alternative scenarios for the period 2002-2032. The bulk of the report is devoted to the topics listed above. Not only does *GEO-3* present the global picture, but it also breaks down information according to regions. It can be downloaded at *www.unep.org/geo/geo3*. The data used are available at *http://geodata.grid.unep.ch.*



(2002). UNEP. Available from Earthprint Ltd. (see above). Pbk., 446p. ISBN 1-85383-845-4.

Halfway to the Future: Reflections on the Global Condition

Published to mark the 25th anniversary of the US-based Tellus Institute (a non-profit research and policy group), this slim volume takes an almost philosophical approach to environmental challenges such as climate change, water issues, waste, and sustainability in general. Addressing what it calls "the forces that are radically reshaping the world" environmentally and in regard to the quest for sustainable development, *Halfway to the Future* is relatively optimistic. It maintains that "there is yet time to infuse global development with humanistic and ecological principles." However, it stresses that the next 25 years will be critical.

(2001). Tellus Institute, 11 Arlington Street, Boston, Massachusetts, 02116-3411, USA. Tel: +1 617 266 5400, Fax: +1 617 266 8303, E-mail: info@tellus.org, Internet: www.tellus.org. Hbk., 55p. ISBN 0-9712418-0-5.

Global Strategy on Invasive Alien Species

The spread of invasive alien species has increased with globalization. It has become a global ecological, economic and sociological issue requiring coordinated national and international action. This report introduces the international laws and institutions involved, emphasizes the urgency of the problem, reviews economic impacts, and discusses the movements and ecology of invasive species. Management and policy responses and a ten-part strategy are included. The "toolkit" described below suggests practical ways to implement that strategy.

(2001). Global Invasive Species Programme. Available from IUCN Publications Services Unit, 219c Huntingdon Road, Cambridge, CB3 0DL, UK. Tel: +44 1223 277894, Fax: +44 1223 277175, E-mail: info@books.iucn.org, Internet: http://jasper.stanford.edu/GISP. Pbk., 50p. ISBN 2-8317-0609-2.

Invasive Alien Species: A Toolkit of Best Prevention and Management Practice

Resulting from a 1999 workshop in Kuala Lumpur, this "toolkit" focuses on small island systems, where the impact of invasive alien species on biodiversity tends to be greatest. However, it is intended for worldwide use and includes suggestions for local adaptation. Relying on a large number of case studies, it covers prevention and risk analysis methods, early detection tools and management approaches.

(2001). Global Invasive Species Programme. Available from CABI Publishing, Wallingford, Oxon, OX10 8DE, UK, or 10 East 40th Street, Suite 3203, New York, NY, 10016, USA. Tel: +44 1491 832111, Fax: +44 1491 833508, E-mail: cabi@cabi.org, Internet: www.cabi.org. Pbk., 228p. ISBN 0-85199-569-1.

Traveling Light: New Paths for International Tourism

By reorienting tourism, it might be possible to preserve the qualities that make destinations attractive while increasing the industry's long-term benefits. Worldwatch Paper 159 is not limited to a discussion of ecotourism. It also considers the policy and regulatory changes needed to put tourism in general on a more sustainable footing. Governments, business, communities and tourist groups are working to make tourism more socially beneficial and environmentally sound. There is a need for education-related initiatives, including entry fees and tourist training.

L. Mastny (2001). Worldwatch Institute, 1776 Massachusetts Ave., N.W., Washington, DC, 20036, USA. Tel: +1 202 452 1999, Fax: +1 202 296 7365, E-mail: worldwatch@worldwatch.org, Internet: www.worldwatch.org. Pbk., 88p. ISBN 1-878071-61-0.

Unnatural Disasters

Worldwatch Paper 158 presents the increasingly accepted view that many so-called natural disasters are caused by environmentally destructive practices. It points out that the number of people at risk, especially in developing countries, is increas-

ing. *Unnatural Disasters* focuses on forest degradation, river works, wetland destruction and climate destablization. These are among the main elements of a process the author describes as "unravelling the strands of a complex ecological safety net." Measures that could be taken involving community-based disaster preparedness, settlement policies, infrastructure siting and improved early warning are outlined. The Worldwatch Papers are short studies written by members of the Worldwatch Institute research staff and reviewed by outside experts.

J.N. Abramovitz (2001). Worldwatch Institute (see State of the World 2002 above). Pbk., 62p. ISBN 1-878071-60-2.

Consumption Opportunities: Strategies for Change

The core of this report is a strategic model intended to help overcome difficulties related to the debate on sustainable consumption. *Consumption Opportunities* sums up that debate since the 1992 Rio summit, outlines the main issues, and identifies problems that have impeded progress. It reviews proposed and existing policies and measures that address sustainable consumption and examines the social, cultural, economic and environmental benefits sustainable consumption can bring. *Consumption Opportunities* is aimed at readers representing what it refers to as the three "major agents" of implementation: government, industry and civil society (as well as, to a lesser extent, academia).

(2001). UNEP. Available from Earthprint Ltd. (see above). Pbk., 69p. ISBN 92-807-2071-6.

Human Development and the Environment: Challenges for the United Nations in the New Millennium

Growing out of a conference in 2000 at United Nations University in Tokyo, this collection examines challenges in the new millennium related to trends such as globalization, population growth, urbanization, climate change and desertification. Poverty, equity, education, health, biodiversity and international cooperation are related issues. Arguing for the integration of environmental issues in development approaches, the authors examine ways the international community and the UN system can work to eradicate poverty and reduce environmental deterioration.

H. van Ginkel et al., eds. (2002). UNU Press, 53-70, Jingumae 5-chome, Shibuya-ku, Tokyo, 150-8925, Japan, Tel: +81 3 3499 2811, Fax: +81 3 3406 7345, E-mail: sales@hq.unu.edu, Internet: www.unu.edu. Pbk., 313p. ISBN 92-808-1069-3.

Basic Environmental Health

Citing a lack of trained personnel in the environmental health field, UNEP's Division of Policy Development and Law and the World Health Organization have produced a new textbook for university students. *Basic Environmental Health* takes an interdisciplinary approach, drawing on the social, natural and health sciences. Worldwide as much as 25% of disease is rooted in humans' living and working environment. The authors discuss exposure issues as well as sustainable development themes, ethical questions and planning methods. Both direct and indirect links between environment and health are examined, and there are case studies and exercises for use in building skills that can help assess and manage environmental health problems. This publication is part of a kit, including a teacher's guide and a package of projection-ready tables and graphs.

A. Yassi et al. (2001). UNEP, WHO. Oxford University Press, 198 Madison Avenue, New York, NY, 10016, USA. Tel: +1 212 726 6000, Fax: +1 212 726 6440. Internet: www.oup-usa.org. Hbk., 439p. ISBN 0-19-513558-X.

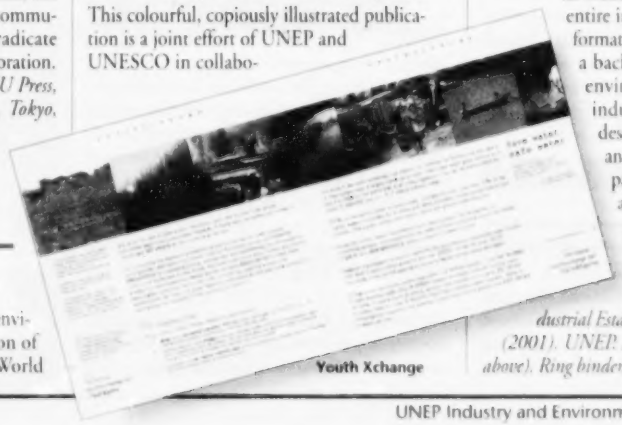
Environmentally Related Taxes in OECD Countries: Issues and Strategies

Economic instruments, including environmentally related taxes, play an increasing role in the environmental policies of developed countries. This publication from the Organisation for Cooperation and Development is the culmination of over two years of work by the OECD Joint Meetings of Tax and Environment Experts. The use of such taxes and their effectiveness in reducing damage to the environment are addressed. *Environmentally Related Taxes in OECD Countries* finds these taxes to be a "powerful tool" for implementing environmental strategy. It also describes obstacles to increased use of environmental taxes (e.g. concerns about competitiveness and distributional effects) and suggests ways to overcome such barriers. Particular attention is given to issues and options related to taxes on greenhouse gases.

(2001). OECD Publications, 2 rue André-Pascal, 75775 Paris Cedex 16, Tel: +33 1 45 24 81 67, Fax: +33 1 45 24 19 50, E-mail: sales@oecd.org, Internet: www.oecd.org/bookshop. Pbk., 142p. ISBN 92-64-18731-6.

YouthXchange: Training Kit on Responsible Consumption

This colourful, copiously illustrated publication is a joint effort of UNEP and UNESCO in collaboration with the Media, Ecology and Technology Association and Consumers International. Intended to be used in conjunction with a web site (*www.youthxchange.net*), it gives young people practical ideas on making their consumption and behaviour patterns more sustainable. *YouthXchange* covers a wide range of topics, including sustainable consumption, mobility, tourism, energy, and "the global village". It can be downloaded at *www.uneptie.org/pc/sustain/youth/youthxchange.htm*.



(2002). UNEP, UNESCO. Available from Earthprint Ltd. (see above). Pbk., 53p. ISBN 92-807-2128-3.

Corporate Social Responsibility: A Dutch Approach

In late 1999, the Dutch government asked the Netherlands Social and Economic Council (SER) to prepare an advisory report clarifying the CSR concept. *Corporate Social Responsibility* includes the SER report, a summary of the white paper issued by the government in response, and an introduction by the head of SER setting this report in a Dutch economic and social context. Both the government and the SER stress the value of the OECD Guidelines for Multinational Enterprises, the text of which is also included. The report reflects a consensus that emerged from a year-long debate on CSR involving labour representatives, employers' associations and independent experts. The SER uses the expression "profit, people and planet" to sum up what CSR is about. The government has concluded that CSR is firmly established as a phenomenon in Dutch society.

(2001). SER, PO Box 90405, 2509 LK The Hague, The Netherlands, Tel: +31 70 3 499 499, Fax: +31 70 3 832 535, E-mail: ser.info@gw.ser.nl, Internet: www.ser.nl. Pbk., 128p. ISBN 90-232-3717-X.

Environmental Management for Industrial Estates: Information and Training Resources

The latest publication in UNEP's series on industrial estates shows how conventional environmental management can be applied to an entire industrial park. In ring binder format with CD-ROM, it constitutes a background paper that analyzes environmental issues specific to industrial estates. Included are a description of impacts requiring an estate-wide response, briefing papers and case studies, slides, and information on additional resources, along with a copy of UNEP DTIE's 1997 Technical Report No. 39, *The Environmental Management of Industrial Estates*.

(2001). UNEP. Available from Earthprint (see above). Ring binder, 462p. ISBN 92-807-2078-3.

Environmental Policy, International Agreements and International Trade

Using both theoretical analysis and empirical modelling, the articles in this collection focus on two key factors in international environmental policy: the transboundary nature of some environmental problems, and the fact that, even if pollution were strictly domestic, trade links among countries mean domestic policies can have international implications. Four issues are addressed: how to design agreements so as to increase the number of countries that might join them; in the case of agreements concerning a limited number of countries, how to design environmental policies to reduce the effect of higher emissions by non-signatory countries; the effects of scale economies and imperfect competition in international markets; and how national governments might distort their environmental policies for strategic reasons, with a focus on the implications of this possibility for the sovereignty of nations when it comes to environmental policy-making.

A. Ulph, ed. (2001). Oxford University Press, Great Clarendon Street, Oxford OX2 6DP, UK. Tel: +44 1865 556767, Internet: www.oup.co.uk. Hbk., 335p. ISBN 0-19-829329-1.

Environmental Problems in an Urbanizing World

This new edition of what was formerly called *Environmental Problems in Third World Cities* has been updated and expanded, largely by David Satterthwaite with contributions by Diana Mitlin (Jorge Hardoy died in 1993). *Environmental Problems in an Urbanizing World* describes cities' environmental problems, the effects on human health and local ecosystems, and the global impact of cities (their "ecological footprints," greenhouse gas emissions), as well as how such phenomena affect them. Measures to help cities meet sustainable development goals are recommended, focusing on practical and affordable solutions. The authors note that such solutions depend on city governments being competent and accountable, and on adequate support for low-income people and organizations.

J.E. Hardoy, D. Mitlin and D. Satterthwaite (2001). Earthscan Publications Ltd., 120 Pentonville Road, London, N1 9JN, UK. Tel: +44 20 7278 0433, Fax: +44 20 7278 1142, E-mail: earthinfo@earthscan.co.uk, Internet: www.earthscan.co.uk. Pbk., 448p. ISBN 1-85383-719-9.

Energy

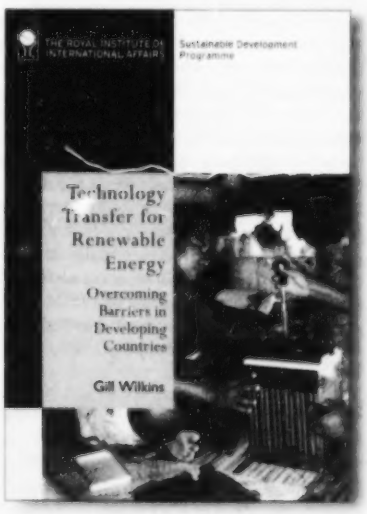
Living in One World: Sustainability from an Energy Perspective

The World Energy Council undertook this study as a follow-up to the *World Energy Assessment* and *Energy for Tomorrow's World: Acting Now!* Both those studies were published in 2000 and were largely aimed at policy-makers. *Living in One World*, written for the general public, looks at the effects of human activities in general (and energy use in particular), including the role of energy in development. Examining a number of sustainability indicators, it presents contrasting scenarios: "An Unliveable World" and "A Liveable World." Readers are invited to take part in a similar exercise using the WEC web site (see below).

(2001) World Energy Council, 5th Floor, Regency House, 1-4 Warwick Street, London W1R 6LE, UK. Tel: +44 20 7734 5996, Fax: +44 20 7734 5926, E-mail: info@worldenergy.org, Internet: www.worldenergy.org. Pbk., 196 p.

Technology Transfer for Renewable Energy: Overcoming Barriers in Developing Countries

Drawing on case studies from the Asia-Pacific region and Africa, the author describes the main barriers to successful transfer of energy technology to developing countries using renewable sources. He also reviews the roles of key players and discusses how the clean development mechanism of the Kyoto Protocol can stimulate investment. Intended for planners, policy-makers and investors, as well as for energy, environment and development specialists, the book aims to provide practical examples of how to speed up and facilitate technology transfer. It focuses on two technologies in particular: combined heat and power systems based on biomass and connected to the grid; and stand-alone home solar systems.


THE ROYAL INSTITUTE OF INTERNATIONAL AFFAIRS
Sustainable Development Programme
Technology Transfer for Renewable Energy
Overcoming Barriers in Developing Countries
Gill Wilkins

G. Wilkins (2002). Royal Institute of International Affairs. Available from Earthscan (see above). Pbk., 237p. ISBN 1-85383-753-9.

Towards a Sustainable Energy Future

The International Energy Agency regards sustainable development as a major challenge for the energy sector. *Towards a Sustainable Energy Future* helps provide a context for a better understanding of this issue. It gives particular attention to seven areas of energy policy-making that the IEA sees as having important implications for sustainability: energy supply, security, market reform and efficiency, renewables, sustainable transport, and flexible market mechanisms related to greenhouse gases. A separate chapter treats challenges specific to the developing world and other non-IEA countries.

(2001). IEA. Available from OECD Publications (see above). Pbk., 254p. ISBN 92-64-18688-3.

Climate Change/ Air Pollution

Ozone Connections: Expert Networks in Global Environmental Governance

The authors, who are sociologists, suggest that the Montreal Protocol's success in reducing production, consumption and atmospheric release of ozone-depleting substances is of major importance to decision-makers seeking to implement conventions that address other global environmental issues, such as climate change and biodiversity. Presenting their book as "a case study of a global environmental experiment that worked," they argue that the Montreal Protocol's innovative language, its flexibility, and (of particular importance) its use of assessment panels are elements that can be replicated. *Ozone Connections* reviews over ten years of work by the Technology and Economic Assessment Panel set up under the protocol, and on the Technical Options Committees established by the panel. The TEAP-TOC network, with its "careful construction of connections" and "shared sense of community and vision", is seen as key to the striking achievements under the protocol.

P. Canan and N. Reichman (2002). Greenleaf Publishing Ltd., Aizlewood's Mill, Nursery Street, Sheffield, S3 8GG, UK. Tel: +44 114 282 3475, Fax: +44 114 282 3476, E-mail: sales@greenleaf-publishing.com, Internet: www.greenleaf-publishing.com/catalogue/ozone.htm. Hbk., 228p. ISBN 1-874719-40-3.

Inter-Linkages Between the Ozone and Climate Change Conventions, Part 1: Inter-Linkages Between the Kyoto and Montreal Protocols

The latest publication in the United Nations University's Inter-Linkages series is a joint effort by UNU, UNEP and the Massachusetts Institute of Technology's Program on Global Accords and Alliance for Global Sustainability. The aim is to bridge the gaps between science, technology and policy when it comes to implementation of international conventions. This on-line publication represents the results of a test case on "issue management," a concept identified in the 1997 Unit-

ed Nations reform programme as a useful approach to coordinating the activities of various UN bodies. The choice of the ozone and climate change conventions is related to the achievements of the Montreal Protocol, considered one of the most successful cases of international cooperation on an environmental issue. *Linkages Between the Kyoto and Montreal Protocols* compares the institutional backgrounds of the two agreements, examines the lessons and challenges presented by both protocols, looks at potential conflicts between the two and ways to mitigate them, and discusses challenges for developing countries. It concludes with a number of policy guidelines and recommendations.

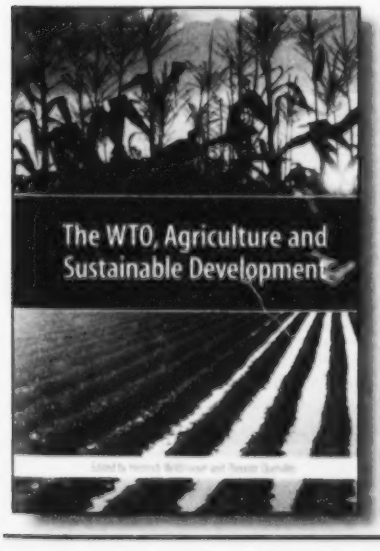
(2002). UNU, UNEP, GSSD, Alliance for Sustainability. Available on-line only at www.uneptie.org/ozonaction/library/policy/main.html.

Industry Sectors

The WTO, Agriculture and Sustainable Development

The professed purpose of this book is to identify the strengths and weaknesses of liberalized world trade, especially as it affects agriculture and forestry. It also aims to investigate whether the World Trade Organization agreements provide sufficient measures to react to trade-related impacts on sustainability, environmental protection and food security. Taking the case of Austria as a starting point, the editors include articles on the current performance of the world trade system and WTO, international trade theory, and aspects of international trade relating to the environment and agriculture. They close with several theoretical propositions for harmonizing sustainable agriculture and world trade.

H. Wohlmeyer and T. Quendler, eds. (2002). Greenleaf Publishing Ltd. (see above). Hbk., 364p. ISBN 1-874719-45-4.



Environmental Aspects of Phosphate and Potash Mining

Unless it is carefully carried out, the mining of phosphate rock and potash to produce mineral fertilizer can have serious environmental consequences. These include air and water pollution, noise and vibration, and high-volume waste production. *Environmental Aspects of Phosphate and Potash Mining* discusses measures that companies are taking to address such potential environmental effects, as well as related social issues. Covering over 30 operations in 11 countries, it reviews measures that have led to improved safety and environmental performance and site rehabilitation/reclamation. This is the fifth in a series of studies published jointly by UNEP and the International Fertilizer Industry Association (IFA). It can be downloaded at no charge from *www.uneptie.org/pc/mining/library/publications/books.htm#phosphate.*

(2001). UNEP, IFA. Available from Earthprint Ltd. (see above). Pbk., 60p. ISBN 92-807-2052-X.

Can Sustainability Sell?

McCann-Erickson, working in close cooperation with UNEP, has produced a short, colourful sampler of approaches to sustainable consumption. Drawing on surveys conducted by companies within the McCann-Erickson group, the booklet explores how young people view the issue, the importance to consumers of corporate social responsibility, the effect of the "new tribalism", and the relationship of sustainability to company health. It also includes a look at UNEP's Advertising and Communication Forum (of which McCann-Erickson is a member) and a number of company case studies. This publication, aimed primarily at company managers and marketing professionals, makes a case for sustainability principles as potentially essential to brand health and future profitability.

(2002). UNEP, McCann-Erickson WorldGroup. Available from Mike Lowhurst, McCann-Erickson, 7-14 Herbrand Street, London WC1N 1EX, UK, Tel: +44 20 7961 2321, Fax: +44 20 7837 3773. Pbk., 28p.

Industry as a Partner for Sustainable Development

This collection, the result of a UNEP-facilitated process involving representatives from industry, labour and NGOs, documents sector-specific progress in implementing Agenda 21, building on 22 industry-driven sectoral reports. *10 Years After Rio* outlines achievements and unfinished business as reported by participating industry sectors, while noting the perspectives and concerns of non-governmental and labour organizations. UNEP's partners in producing the sectoral reports are shown below. A collection of executive summaries from individual reports has also been prepared. Like *10 Years After Rio*, it is available in English and French. Free downloads of these reports are available at *www.uneptie.org/outreach/wssd/publications/publications.htm.*

(2002). UNEP. Available from Earthprint Ltd. (see above). Pbk. Unless otherwise indicated, reports are in English only.

10 Years After Rio: The UNEP Assessment
(English and French.) 64p. ISBN 92-807-2197-6.
Compilation of Executive Summaries
(English and French.) 112p. ISBN 92-807-2196-8.
Accounting
Association of Chartered Certified Accountants. 68p. ISBN 92-807-2174-7.
Advertising
European Association of Communications Agencies and World Federation of Advertisers. 68p. ISBN 92-807-2175-5.
Aluminium
International Aluminium Institute. 40p. ISBN 92-807-2176-3.
Automotive
International Automobile Manufacturers. 46p. ISBN 92-807-2177-1.
Aviation
Air Transport Action Group. 56p. ISBN 92-807-2178-X.
Chemicals
International Council of Chemical Associations. 84p. ISBN 92-807-2197-8.
Coal
World Coal Institute. 76p. ISBN 92-807-2180-1.
Construction
Confederation of International Contractors' Associations. 60p. ISBN 92-807-2181-X.
Consulting Engineering
International Federation of Consulting Engineers. 68p. ISBN 92-807-2182-8.
Electricity
E7. 52p. ISBN 92-807-2189-5.
Fertilizer
International Fertilizer Industry Association. 64p. ISBN 92-807-2183-6.
Finance and Insurance
UNEP Finance Industry Initiatives. 72p. ISBN 92-807-2184-4.
Food and Drink
Confederation of the Food and Drink Industries of the EU. 64p. ISBN 92-807-2185-2.
Information and Communications Technology
Global e-Sustainability Initiative. 42p. ISBN 92-807-2186-0.
Iron and Steel
International Iron and Steel Institute. 56p. ISBN 92-807-2187-9.
Oil and Gas
International Petroleum Industry Environmental Conservation Association and International Association of Oil and Gas Producers. 84p. ISBN 92-807-2188-7.
Railways
International Union of Railways. 72p. ISBN 92-807-2190-7.
Refrigeration
International Institute of Refrigeration/Institut International du Froid. 78p. ISBN 92-807-2191-5.
Road Transport
International Road Transport Union. 32p. ISBN 92-807-2192-3.

Tourism
World Travel & Tourism Council, International Federation of Tour Operators, International Hotel and Restaurant Association, International Council of Cruise Lines. 76p. ISBN 92-807-2193-1.

Waste Management
International Solid Waste Association. 72p. ISBN 92-807-2194-2.

Water Management
International Water Association. 56p. ISBN 92-807-2195-0.

Chemicals, Pollution and Accidents

The Handbook of Hazardous Materials Spills Technology

This comprehensive and therefore bulky handbook, edited by an Environment Canada scientist, covers hazardous material programmes (with a chapter devoted to UNEP's APELL, and one each on the French and New Zealand programmes), nuclear/radiological emergencies, risk assessment (including details concerning the Swiss approach), spill modelling and countermeasures, disposal, safety (including communications issues), and perspectives on specific chemicals (ammonia, chlorine, MTBE, sulphuric acid, PCBs, sulphur trioxide and oleum, pentachlorophenol and sodium cyanide. Sections are devoted to case studies and chemical spill data, including a chapter on Internet data searches.

M. Fingas, ed. (2002). McGraw-Hill Professional, 2 Penn Plaza, 12th Floor, New York, NY, 10121-2298, USA. Tel: +1 212 512 4471, Fax: +1 212 512 2186, Internet: www.books.mcgraw-hill.com. Hbk., 800p. ISBN 0-07-135171-X.

IPCS Environmental Health Criteria

The International Programme on Chemical Safety is a joint venture between UNEP, the International Labour Organisation (ILO) and the World Health Organization (WHO). The IPCS Environmental Health Criteria series provides critical reviews of potential health and environmental effects of chemicals and combinations of chemicals. They are primarily risk evaluations, and they are based on published and unpublished studies.

Criteria documents are in English, with summaries in French and Spanish. The series is available from WHO and from WHO sales agents. Recently published:

ECH 222: Biomarkers in Risk Assessment: Validity and Validation

(2001). Pbk., 238p. ISBN 92-4-157222-1. WHO, Distribution and Sales, CH-1211 Geneva 27, Switzerland. Tel: +41 22 791 2476, Fax: +41 22 791 4857, E-mail: bookorders@who.ch, Internet: www.who.int.

Water

Rainwater Harvesting and Utilisation: An Environmentally Sound Approach for Sustainable Urban Water Management

This "introductory guide for decision-makers" is the second publication in the Urban Environment Series from UNEP's International Environmental Technology Centre (IETC). Published in cooperation with the city government of Sumida, Japan, and People for Promoting Rainwater Utilisation, *Rainwater Harvesting and Utilisation* discusses reasons to collect rainwater, describes the technology, and examines policy and health considerations. It also reviews design and maintenance of rainwater facilities, among other matters, and provides case studies from around the world.

(2001). UNEP-DTIE-IETC. Available from Earthprint Ltd. (see above). Pbk., 12p.

Environmentally Sound Technologies for Wastewater and Stormwater Management: An International Source Book

Compiled in collaboration with Australia's Murdoch University Environmental Technology Centre, this volume is a sequel to the source book on municipal solid waste management produced by UNEP's International Environmental Technology Centre in 1996. (Both these books, like the one reviewed immediately below, are part of the IETC Technical Publication Series.) Aimed primarily at decision-makers concerned with wastewater and stormwater services, the source book provides information on experiences and ideas from around the world. It is divided into three sections: Toward a Framework for Wastewater and Stormwater Management, Environmentally Sound Technologies and Practices, and Regional Overviews and Information Services. Appendices cover public health issues, costs and IETC's "maE-STro" database.

(2002). UNEP-DTIE-IETC. Available from Earthprint Ltd. (see above). Pbk., 613p. ISBN 92-807-1820-7.

Environmentally Sound Technologies in Wastewater Treatment for the Implementation of the UNEP Global Programme of Action (GPA) "Guidance on Municipal Wastewater"

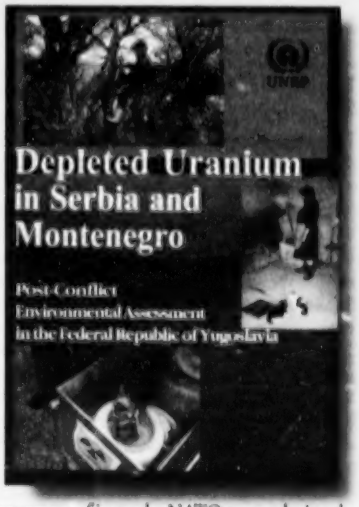
A companion volume to the source book reviewed above, this booklet summarizes Section 2 of the source book and provides extra information specific to the municipal wastewater recommendations of UNEP's Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities. It covers wastewater and stormwater characteristics, collection, treatment, reuse and disposal; sludge treatment, reuse and disposal; and sound practices.

(2001). UNEP-DTIE-IETC. Available from Earthprint Ltd. (see above). Pbk., 31p. ISBN 92-807-2100-4.

National/Regional

Depleted Uranium in Serbia and Montenegro: Post-Conflict Environmental Assessment in the Federal Republic of Yugoslavia

Depleted uranium (DU) is what is left over when most of the highly radioactive isotopes of natural uranium are removed. Certain properties of DU, such as its high density (about twice that of lead), have led to its use in munitions designed to penetrate armour plate or to protect military vehicles. UNEP's work on DU began in 1999 with a desk


UNEP
Depleted Uranium in Serbia and Montenegro
Post-Conflict Environmental Assessment in the Federal Republic of Yugoslavia

assessment of its use by NATO troops during the Kosovo conflict and continued with a field assessment report in 2001 on Kosovo itself (article and book review, *Industry and Environment*, Vol. 24, No. 1-2). Now a new phase has been completed with a mission to Serbia and Montenegro that included use of the latest air sampling techniques. The investigators also report on experience that has been gained since their Kosovo mission concerning the behaviour of DU in the environment.

(2002). UNEP. Available from Earthprint Ltd. (see above): Pbk., 199p. ISBN 92-807-2146-1.

Editions Françaises

Guide de recommandations pour une meilleure gestion de l'eau entre les régions de têtes de bassin et d'aval

L'usage des ressources en eau envenime les relations entre les régions d'amont et d'aval d'un même bassin versant, les régions de têtes de bassin subissant

généralement les décisions d'aménagement des plaines. L'Office International de l'Eau (OIEau) et la Junta de Extremadura (Espagne) ont proposé à l'Union européenne, dans le cadre du Programme INTERREG IIC, de réaliser un guide de recommandations pour améliorer la gestion de l'eau dans les régions de la diagonale continentale (Limousin, Auvergne, Midi-Pyrénées, toutes les régions d'Espagne et du Portugal). Le guide a pour but de faciliter la mise en cohérence des politiques de l'eau et de l'aménagement du territoire dans une logique de développement durable de ces régions. Les recommandations fournissent quelques pistes d'actions pour promouvoir une gestion globale et intégrée des ressources hydriques.

(2001). Office International de l'eau, 15, rue Edouard Chamberland, 87065 Limoges Cedex, France. Tél. : +33 5 55 11 47 90, Fax : +33 5 55 11 47 48, E-mail : n.jacquin@oieau.fr, www.oieau.fr/amont-aval. 64p.

Guide des organismes d'analyse sociétale

Ces dernières années, de multiples fonds et indices boursiers éthiques ont vu le jour et aujourd'hui, ce sont plus de 1500 milliards d'euros qui sont placés selon des critères éthiques dans le monde. Les entreprises soucieuses d'intégrer ces fonds doivent s'organiser face à l'afflux de questionnaires d'évaluation en provenance d'organismes aussi divers que méconnus. Tout comme les entreprises, les gestionnaires de fonds et autres investisseurs s'interrogent sur la qualité et les moyens d'analyse des agences de notation, instituts de recherche et autres conseillers en investissement éthique :

- Qui sont les organismes qui évaluent les entreprises selon leur « performance sociétale » ?
- Quelles sont leurs méthodes ?
- Sur quels critères sont crées les fonds et indices « socialement responsables » ?

Ce guide, publié par l'ORSE, EPE et l'ADEME, apporte des réponses précises à ces questions et dresse un panorama des organismes d'analyse représentatifs de ce mouvement.

(2001). ADEME Editions, 27, rue Louis Vica, 75737 PARIS Cedex 15, France. Tél. : + 33 2 41 20 42 30, Fax : +33 2 41 20 41 98. 159 p., ISBN 2-86817-645-3.

Web Site Highlights

www.recyclenetcorp.com

The Canadian-based RecycleNet Corporation, which founded the Recycler's World site (*www.recycle.net*) in 1995, provides services for the recycling and virgin materials industry, notably a system called Global Access to the Recycling Market, and a system of Internet portals that facilitate e-trading. It bought out Global Recycling Network in April 2002.

For more information, contact: RecycleNet Corporation, PO Box 24017, Guelph, Ontario, Canada, N1E 6V8, Tel: +1 519 767 2913.

www.newdream.org

The Center for a New American Dream works with individuals, institutions, communities and businesses to conserve natural resources and promote positive changes in the way goods are produced and consumed. Its video *More Fun, Less Stuff* can be ordered from this site, which also describes current programmes of the Center.

For more information, contact: Center for a New American Dream, 6930 Carroll Ave., Suite 900, Takoma Park, MD, 20912, USA, Tel: +1 301 891 3683, Fax: +1 301 891 3684, E-mail: newdream@newdream.org.

www.cfsd.org.uk

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Home page of the Centre for Sustainable Design at the Surrey Institute of Art & Design in the UK, which organizes courses, conferences and workshops, and conducts research, on developing environmentally friendly products. UNEP's Sustainable Consumption Programme is represented on its advisory board. The site includes free downloads of the *Journal of Sustainable Product Design.*

For more information, contact: Centre for Sustainable Design, Surrey Institute of Art & Design, University College, Faculty of Design, Falkner Road, Farnham, Surrey GU9 7DS, UK. Tel: +44 1252 89 2772, Fax: +44 1252 89 2747, Email: cfsd@surrart.ac.uk.

www.virtualexhibit.net

Virtual Exhibition, a joint project of Business Action for Sustainable Development and the United Nations Development Programme, will bring the proceedings of the World Summit on Sustainable Development to a global audience, in real time via the Internet, and encourage participation in the summit through on-line exchanges. It will also display a multitude of sustainable development projects being carried out around the world.

For more information, contact: contact@virtualexhibit.net. Media queries may be directed to Bryce Corbett, Tel: +33 1 49 53 29 87, E-mail: bryce.corbett@iccwbo.org.

www.oceansatlas.org

UNEP

Launched on World Environment Day, this new on-line atlas of the oceans aims to pool knowledge about the marine environment and thus help reduce the damage being done by overfishing and pollution. UNEP is a partner in the project, which is designed for both policy-makers and the public. The site includes contributions from experts around the world, divided into four main sections: about the oceans, uses of the oceans, issues and geography.

For more information, contact: John T. Everett, Fisheries Resource Division, Food and Agriculture Organization of the UN, Via delle Terme di Caracalla, I-00100 Rome, Italy, E-mail: john.everett@fao.org.

L'Homme et le climat

Le but de ce rapport est de faire la part des dangers réels liés aux changements de climat pouvant résulter des activités humaines, des craintes manquant de fondements scientifiques, et de l'exigence de précaution et de prudence revendiquée par l'individu et la société. Reprenant les conclusions d'auditions, d'entretiens, de travaux en séances publiques ou en commissions, le livre expose le point de vue de scientifiques et de praticiens de l'industrie ; il fait le point sur les aspects scientifiques du changement climatique, les négociations internationales sur le climat, les marges de manœuvres économiques, sociales et technologiques afin de réduire les émissions de gaz à effet de serre et de répartir la mise en œuvre des solutions entre les Etats, les entreprises et les citoyens. Il explore quelques premières pistes pour aider les entreprises à répondre au défi climatique.

D. Dron et C. Hirzebhorn (mars 2002). Institut Montaigne, 18, avenue Matignon, 75008 Paris, France. Tél. : +33 1 40 75 73 73, Fax : +33 1 40 75 73 70, E-mail : info@institutmontaigne.org. 92 p.

Les techniques de dépoussiérage des fumées industrielles – Etat de l'art

Les poussières suscitent l'intérêt croissant des responsables de la santé publique, de l'environnement et de l'industrie. Dans quelques années, les réglementations nationales et européennes tiendront probablement compte de la granulométrie des poussières, comme le font déjà certains pays dont les Etats-Unis. Il s'agit de se préparer à ces futures évolutions en acquérant une connaissance des problèmes à résoudre et des solutions disponibles. Cette étude vise à apporter les éléments de réflexion techniques et économiques présidant au choix d'une technologie de dépoussiérage lors de la mise aux normes d'une installation existante ou de la conception d'une nouvelle unité. L'étude comprend deux parties. La première expose la problématique des poussières : le contexte, les diverses techniques de dépoussiérage et les facteurs déterminants pour le choix d'un équipement. La seconde présente de façon approfondie les deux technologies les plus efficaces à ce jour : les filtres à manches et les électrofiltres.

S. Bicocchi et C. L'hospitalier (2002). Editions Tec & Doc, Librairie Lavoisier, 11, rue Lavoisier, 75008 Paris, France, ou 14, rue de Provigny, 94236 Cachan Cedex, France. Tél. : +33 1 42 65 39 95, Internet : www.lavoisier.fr. 294 p. ISBN 2-7430-0485-1.

Since 1990, *Industry and Environment* has been translated into Chinese and distributed in China through the efforts of the Information Division of the Research Center for Eco-Environmental Sciences at the Chinese Academy of Sciences. In a recent letter, Professor Liu Xiaoguang of this Division described some of the ways the publication has been used in China. For instance, teachers and students at the Environment and Engineering College at Shanghai Transport University developed an interactive game based on *Industry and Environment*, and Beijing Television's Science and Education Channel devoted a broadcast to the magazine. Overall, Professor Liu says, "Chinese readers...love the Chinese version."

L'eau ressource vitale

Ce livre s'adresse plus particulièrement à ceux qui ont la responsabilité de former les jeunes. Il explique l'origine et les étapes du cycle naturel de l'eau, traite de la consommation domestique, des utilisations urbaines, agricoles et industrielles, des qualités de l'eau et des règles de gestion. La dernière partie est consacrée aux métiers de l'eau, complétée d'un lexique succinct.

Jean Louis Pascal Ballif (2001). Editions Johanet, 30, rue René Boulanger, 75010 Paris, France. Tél. : +33 1 44 84 78 78. Fax : +33 1 42 40 26 46, 136 p. ISBN 2-900086-66-3.

THE UNEP DIVISION OF TECHNOLOGY, INDUSTRY AND ECONOMICS

Current uses and development of natural resources, technologies and production processes, as well as urbanization patterns, have negative effects on human health and the environment. This is illustrated by unsustainable use of water, land and energy, air and water pollution, persistent and toxic bio-accumulative chemicals in the food chain, and other industry-related problems.

To have a healthy environment, we need to change how we produce and consume goods and services. This change involves revising and developing economic policies and trade practices, so as to integrate environmental issues in the planning and assessment processes.

UNEP's Division of Technology, Industry and Economics (UNEP DTIE) was created in 1998 to help decision-makers in governments, local authorities and industry develop and adopt policies and practices that:

- are cleaner and safer;
- use natural resources efficiently;
- ensure adequate management of chemicals;
- incorporate environmental costs;
- reduce pollution and risks for humans and the environment.

UNEP DTIE, whose main office is in Paris, is composed of:

◆ **The International Environmental Technology Centre (Osaka)**, which promotes the adoption and use of environmentally sound technologies, with a focus on the environmental management of cities and freshwater basins, in developing countries and countries in transition.

◆ **The Production and Consumption Branch (Paris)**, which fosters the development of cleaner and safer production and consumption patterns that lead to increased efficiency in the use of natural resources and reductions in pollution.

◆ **The Chemicals Branch (Geneva)**, which promotes sustainable development by catalyzing global actions and building national capacities for the sound management of chemicals and the improvement of chemical safety world-wide, with a priority on Persistent Organic Pollutants (POPs) and Prior Informed Consent (PIC, jointly with FAO).

◆ **The Energy and OzonAction Branch (Paris)**, which supports the phase-out of ozone depleting substances in developing countries and countries with economies in transition, and promotes good management practices and use of energy, with a focus on atmospheric impacts. The UNEP/RISØ Collaborating Centre on Energy and Environment supports the work of this Branch.

◆ **The Economics and Trade Branch (Geneva)**, which promotes the use and application of assessment and incentive tools for environmental policy, and helps improve the understanding of linkages between trade and environment and the role of financial institutions in promoting sustainable development.

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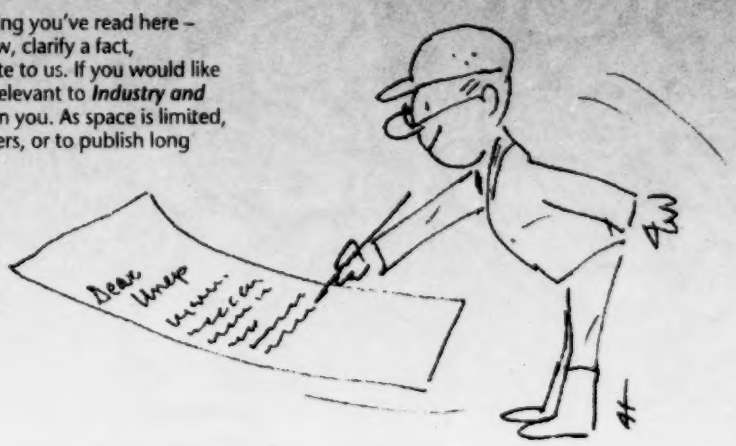

Industry and Environment

a publication of the United Nations Environment Programme
Division of Technology, Industry and Economics

For over 20 years, the quarterly *Industry and Environment* has provided a forum for exchanging information and experience. Articles are contributed by industry managers, government officials, researchers and others active in the field of sustainable industrial development. Besides reporting on developments of broad international interest, each issue focuses on a particular theme. The themes of recent issues have included the agri-food industry, consumption patterns, urban environmental management, sustainable energy, and mining and sustainable development. Recent issues and archives are available on-line at www.uneptie.org/media/review/ie_home.htm.

The next issue of *Industry and Environment* will focus on UNEP's 7th International High-level Seminar on Cleaner Production.

Industry and Environment is an English language publication, but it often includes articles in French and Spanish. All contributed articles are accompanied by summaries in English, French and Spanish.

The review is also published in Chinese.
For further details, please contact:
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